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Vol. CLXI No. 2106 WITH WHICH IS INCORPORATED THE GRAPHIC JUNE 1 1940

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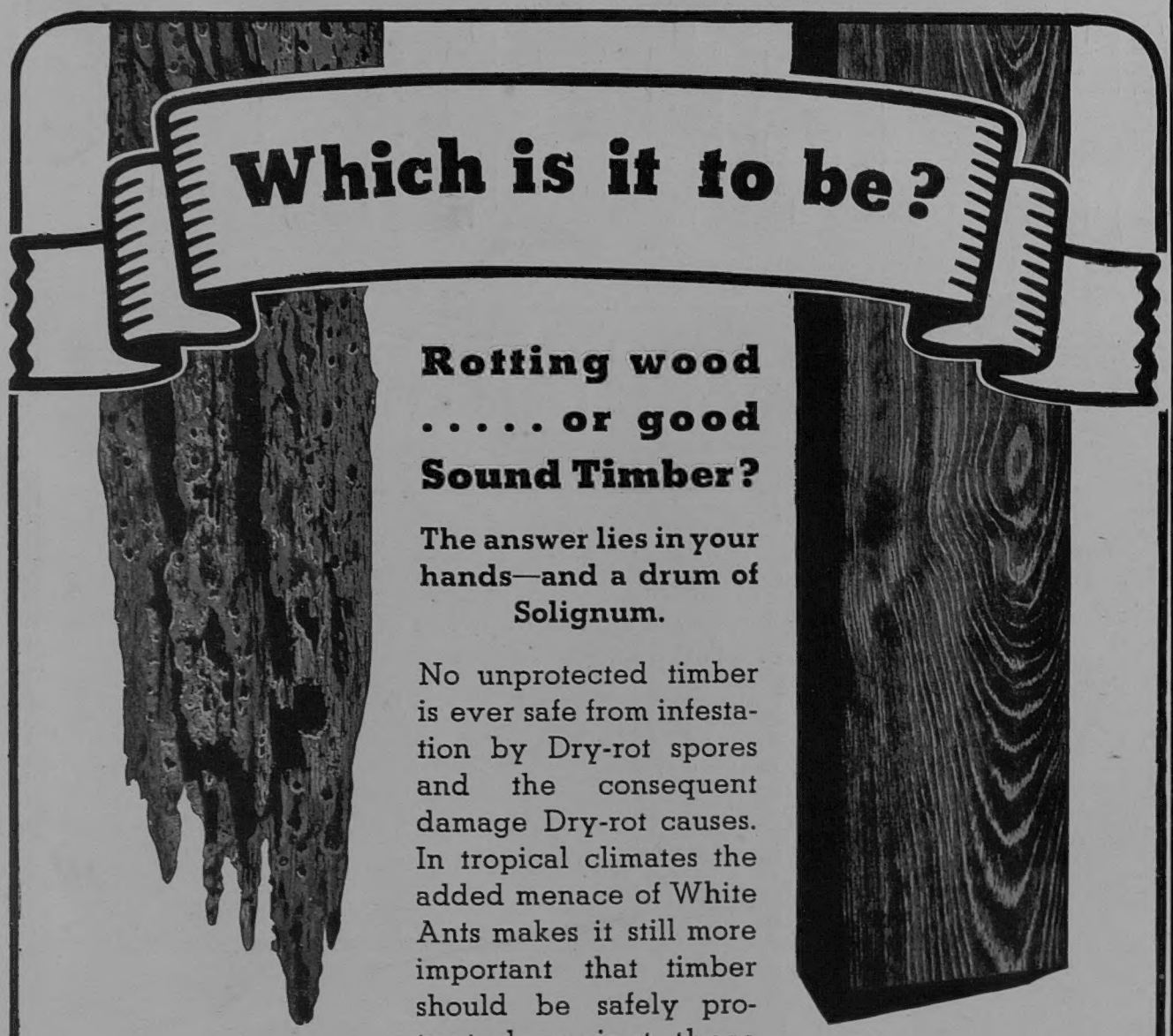

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Volume CLXI No. 2106

THE SPHERE

With which is incorporated "THE GRAPHIC"

The Empire's Illustrated Weekly

London, June 1, 1940

THE KING WHO SURRENDERED HIS COUNTRY

King Leopold III of the Belgians Who Capitulated to the Germans on May 28

At 4 a.m. on Tuesday of this week there took place one of the most astonishing events in recorded military history. With two of his allies occupying positions of great gravity, in Western Belgium and Northern France, King Leopold of the Belgians made approaches to the German Army Command with a view to the surrender of his Army. By four o'clock the Belgian Army laid down its arms and ceased to protect the left flank of the British Expeditionary Force, which was occupying the central portion of the Allied Line to the north of the Arras-Bapaume gap. M. Reynaud, in a broadcast on Tuesday at 8.30 a.m., could scarcely veil his feelings at the defection of the King who but a few days before had appealed for Allied help. "It is a fact without precedent in history." Mr. Churchill in the House of Commons briefly referred to the gravity of the situation and promised a further statement next week

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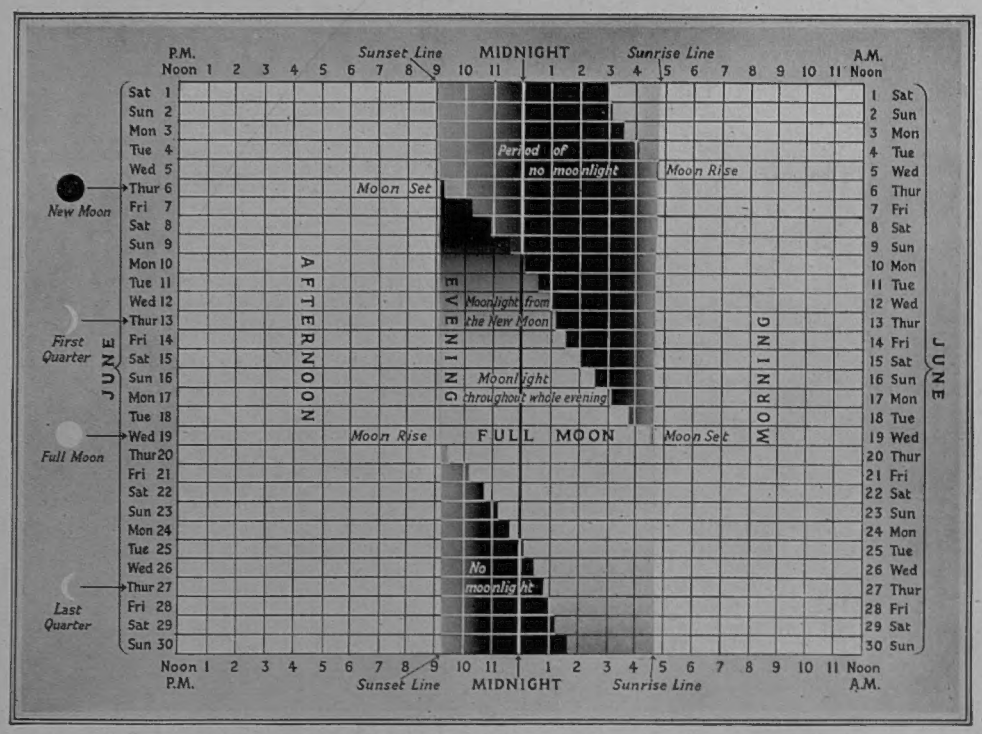
A WAR NEWSLETTER—No. XXXIX

32–34, ST. BRIDE STREET, E.C.4

A SOLEMN HOUR.

—We have reached a crisis in our fate, more grave perhaps than any in our history. Our survival as an Empire and as a free people is at stake. Everything we hold dear, from our children to our faith and freedom and ideals (all the essentials of what made life worth living) are in immediate danger of destruction. The enemy, the most powerful and ruthless, the most relentlessly inspired by hatred and jealousy of us, which we have ever faced, stands over against us at a distance of a few miles, with but a ditch between. That ditch—the Channel—was once an effective moat so long as we had command of the sea. We have that still; but the new fleets of the air make light of the ditch. Against the air-invaders the whole nation must be mobilised. Every man, woman and child must steel their hearts and force themselves to endure with courage and cheerfulness the wanton destruction of lives, treasure, things of immeasurable value which can never be replaced, not to speak of personal property. Those who can still bear arms must meet the enemy from the air and take what toll of them they may. We have our backs to the wall in the last long struggle against the Destroyer of Civilisation who has already laid waste half Europe and will not hesitate, unless restrained by force, to dominate the whole world.



"THE SPHERE'S" MOONLIGHT CHART FOR JUNE: On the 21st of the month the period of lengthening days reaches its peak and nightfall will be brilliantly illuminated by the moon which will have waned for two days. That night it rises shortly after 10 p.m. and continues to shine till dawn. The early part of the month is heralded by only three or four hours of total darkness till the 11th or 12th when the first rays of the crescent moon become apparent. Full moon is on the night of the 19th–20th, rising at 9.15

THE GOOD AND BAD IN DEMOCRACY.

—At such an hour, to regret the past is waste of time; to criticise mistakes, blindness, lazy-mindedness, is a crime. The nations of France and Britain are solid and will resist to the last whatever come, with faith still in their destinies, in their qualities, and in their leaders. We know still that, if Democracy has revealed its great weaknesses in time of war, it is still the only form of government under which we care to live permanently. If, while its methods wasted precious time and divided our resources when they should have been concentrated under one directing force, we have sighed for and called for a greater measure of dictatorship to meet the crisis, those sighs must be cut out, and we must leave in our hearts no room for anything but obedience and courage and an infinite patience. We are Totalitarian for the duration until the Nazi model is overthrown. France and Britain alike in war have often profited swiftly by bitter lessons learned at the price of incredible sacrifices. We learned such lessons in the Crimea, in South Africa, on the Somme and in Flanders. France was still learning them during Nivelle's command in 1917. There were bitter lessons learned in March, 1918, by the Allies. They turned them to good account less than six months later and brought Germany to complete defeat and total surrender. It may be we have not lost our resilience and our power to profit quickly by grave errors and too easy confidence.

LOCAL MILITARY CONTROL.

—In the hour of our country's greatest danger and need, we realise the vital importance of (even now, at this late hour) putting more completely under one central control the various defence organisations in every county. It is a "dictatorship" which all would welcome. The new Local Defence scheme has revealed some of the weaknesses and overlapping of these local services. There was a fine response to Mr. Eden's call but there had been no clear thinking as to the definition of eligibility and "Specials." A.R.P. workers, observers, all enrolled, only to be told they were ineligible. The organisation will with goodwill (local goodwill, above all) be straightened out. Let us pray that this is the very last example of a Minister's clarion call being stultified by the announcement of half considered measures. In many rural areas, every available ex-service man over military age is either an observer, an A.R.P. official or a Special. For men already in full-time work in the country, no other means of military service was available. It is not suggested that observers should be allowed to resign from that corps. But in many remote country areas, A.R.P. and constabulary services are more than adequate, and the release of a very few experienced soldiers to organise the local defence volunteers is not only essential but would not weaken the older organisations.

DAWN PATROL.

—"Gentlemen in England now abed" are a daily diminishing class, now that more and more watchful eyes quarter the sky throughout the "danger hours for parachutists." I enjoyed my first dawn patrol. I had last got up before dawn for the purpose of flighting duck in the "quiet" 1930's. Before that, not since 1914–18 had I seen sunrise. The pain of rising is worth while if only for the smell of the earth just before dawn, and if only (later) for the taste of a cigarette smoked (first of the day) on an empty stomach. This was the order of the day in the bird world: 3.40—Night-jars in complete control, like a billion machine-guns; 3.50—cuckoo began; 4.0—wood-pigeon; 4.5—cock; 4.6—small song-birds first heard; 4.10—pheasant; 4.15—full chorus in full song. N.B.—A solitary fir-tree against the saffron of a clear dawn sky is the most beautiful sight in nature or art. Yes, it was worth it, even though the afternoon found me weary and very irritable.

RUMOUR—THE NATION'S GREAT ENEMY.

—There is one pull which in this war at any rate the country has over the town. In rural areas, remote from large towns and military establishments and from the centres of communication, there is astonishingly little play of rumour. It is a remarkable fact that in the past frightful weeks I have not heard a rumour of any kind, good or bad. Yet I have mixed with all sorts and conditions of men and women in my work and on local duties. Nothing outside our own very limited area has been a subject for rumour. This is very remarkable. In peace-time an English village is a hot-bed of local gossip. But the unexpected has happened. Here in Auburn the well-worn prelude to one more glorious distortion of the truth is never used, because no such pest has managed to settle on our fields and gardens. Why? Is it remoteness? But our roads carry traffic all day long. Our wires hum; we receive our mails and papers punctually. I believe that it is a new manifestation . . . . a hopeful sign of the times. I believe that there are fewer rumour-mongers and fewer people ready to gobble rumour. It is a feather, perhaps, in the cap of the Government, whose policy it is to tell us the truth, and nothing but the truth, as soon as it may be released. It is significant, new and important. How are things in the London Clubs? I am in no anxiety to go and find out.

B.B.C. SHOWMANSHIP.

—It must be the hope of thousands besides myself that, even in this tense and fearful crisis, some authority of Government may find time to exercise over the B.B.C. such limited control as the Government possesses. I have slogged on, week after week, in condemning the vulgar showmanship which the B.B.C. appears to favour and exploit concerning our fighting men. It is not in the spirit of the Army, nor does it march with the temper of the nation, that these heroic young men and their deeds should be made a peepshow. It is revolting to many of us that they should be brought to the microphone and shown off and flattered by compères. The whole policy of the B.B.C. in this respect reveals that it is not in touch with public opinion. It is strange that the commanders in the field and at sea did not, during the waiting months, forbid the exploitation of serving soldiers and sailors by the B.B.C. That the Government should have so long tolerated the showmanship and dramatisation was perhaps a little less surprising. Like the B.B.C. authorities, the Government, during these waiting months, had a fatal belief in the effectiveness of showmanship.

EMPTY LETTER-BOXES.

—The reduction in my own mail, incoming and outgoing, is 50 per cent. The increased postal charges, which account for it, were 70 per cent. This will represent to the Exchequer a very unsatisfactory balance sheet. One of our postmen told me his deliveries had dropped by more than half in bulk. The experiment of the late Chancellor is rapidly being proved short-sighted. Meanwhile, trade and industry are suffering from the imposition. Full postal staffs, superbly organised, are working a "skeleton" service, and presumably there will be dismissals. Never was there a time when the public had more need of the only manner of communication available to the poorest. It is a successful way, no doubt, to save paper. But that was not strictly the Chancellor's job or object. Will the new broom sweep this corner clean? The country to-day would be thankful to shoulder a sane and constructive war budget, however heavy the sacrifices. Sir John Simon's had all the faults of near-sightedness, niggling and half-measures.

VICTORIAN BARRICADES.

—The iron railings really are vanishing. The removals have "made free" a number of jealously-guarded Square gardens and other Victorian cat-walks, and a great many tons of old iron barricades have recently been removed from Hyde Park. I think it is the visible sign that this war of 1939 —— ? has destroyed the last vestiges of privilege, and that the tawdry relics of the Edwardian age are now finally removed. We shall not in our time step back into it. Its scent hung on the air too long, stale and acrid. Those redundant railings and their psychological equivalents should have been scrapped in 1914. But—to come back to earth—we shall not see the removal of the railings which enclose the parks. A great central space, easily defended, in the very heart of London, is an essential safeguard against lawlessness and against any attempt by a section to hold up the nation. Old Timms records that once Queen Caroline talked of shutting up St. James's Park and turning it into a noble garden for St. James's Palace. She asked Walpole what it would cost. "Only *three crowns*, Ma'am." No, the parks have long been and will remain free to the public, but the guarding railings will remain in place.

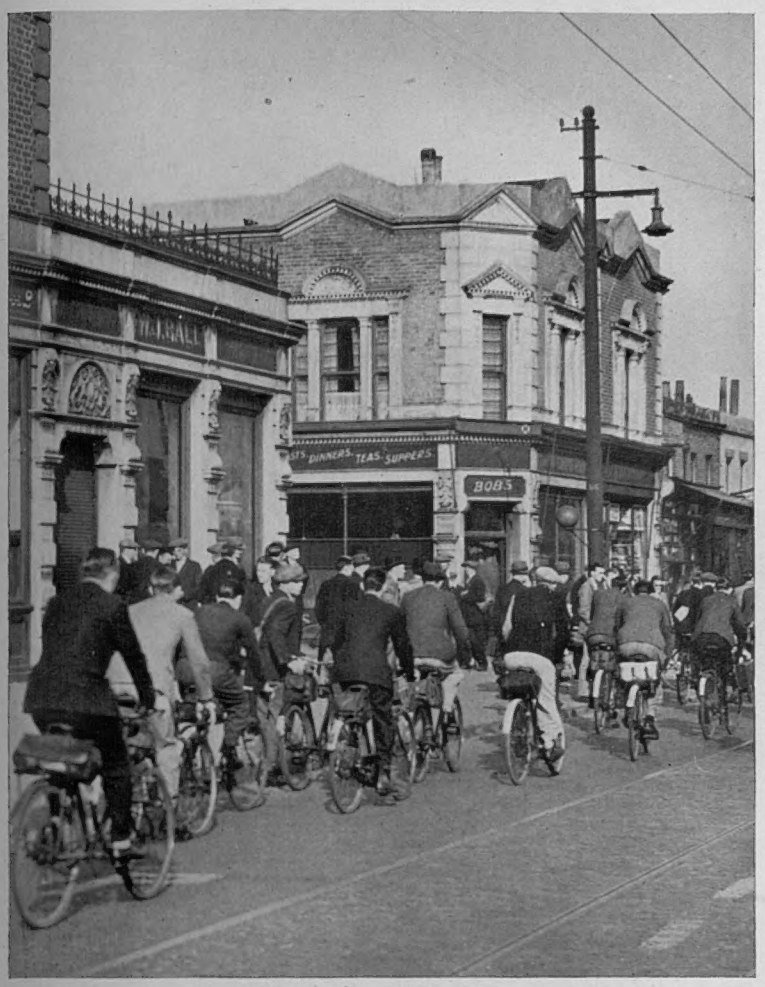
RIGHT HAND—AND LEFT. WORK FOR NEW BROOMS.

—Two cuttings from the Press on the same day gave food for thought. "In a message from Rhyl which appeared in *The Times* yesterday it was stated that as a result of the Army Council's decision to proceed with the scheme for taking over 40,000 acres of agricultural land in Breconshire for use as an artillery range 280 farmers would have to vacate their farms in October." The job of selecting suitable sites was in recent days left in very junior and inexperienced hands. Britain is a small country but it is full of land unsuitable for food growing. And somehow the fiery calls of the Minister of Agriculture to raise more food are douched with cold water by such announcements as these. And what of this:—"Protest against the acceptance by the Post Office of 'fixed odds' betting coupons, word pools or similar competitions was made at the annual conference of the Post Office Controlling Officers' Association at Brighton yesterday. The conference, in passing a resolution of protest, also directed that representations be made to the Postmaster-General with a view to prohibiting such postings. Mr. W. J. Jones (Liverpool), moving the resolution, said that the number of 'fixed odds' coupons posted had in some weeks reached the half-million mark. They placed an unnecessary burden on the Post Office when it was fully occupied with the disposal of correspondence much more vital to the country's welfare. 'In addition,' he added, 'when we are expected to make the fullest use of every scrap of paper, even to the extent of using the backs of envelopes received from the public for the purposes of making endorsements, we cannot view with equanimity the wastage of paper involved.'" One scratches his head and wonders if there was any communication and co-operation at all between domestic departments of the late Government.

THE OLD STAGER

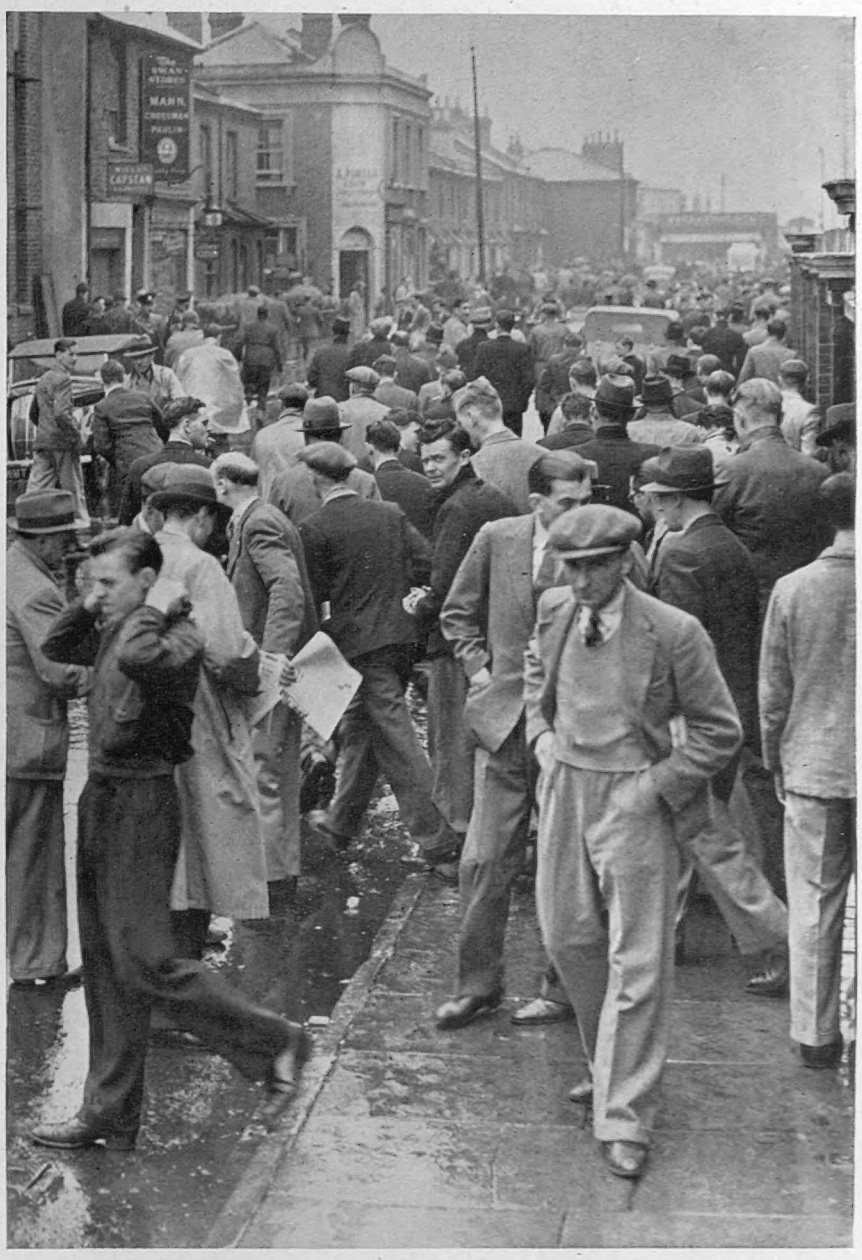
"WORK AND PRAY"

The New War-time Sabbath, With Britain's Workers Responding to the Call



MUNITION FACTORY WORKERS PROCEEDING ON BICYCLES TO WORK ON SUNDAY LAST

Lord Nuffield last week addressed the following message to those of his workers who would be working during the week-end: "That all of you in whose hands is the task of supplying munitions for our forces take for your text on Sunday the words, 'Work and Pray.'" These two scenes show the response



LONDON WORKERS GIVE UP THEIR DAY OF REST IN ORDER TO SPEED UP MUNITION OUTPUT

The sacrifice of the right to rest on the Seventh Day was only a part of the larger sacrifice of Public Rights which had taken place in Parliament last week. In the space of a short afternoon Parliament, in order that the nation might be able to meet the challenge of the enemy, put all traditions in cold storage and authorised the Government to do what it found expedient with everybody and everything. Every subject of the Crown can be set to whatever work is required of him. All property and all industry is put at the public disposal. Banks and builders must employ their resources as they are told. And "profiteering" will be eliminated by an Excess Profits Duty of 100 per cent.

FORGING ARMS

WHITE HOT STEEL BARS ROLL OUT CEASELESSLY AT A BIG MIDLANDS PLANT

The demand for steel of every quality, great though it was, is now intensified. This picture was taken a few days ago in one of the most famous steel-producing plants in England which includes the largest electric furnaces in the country

On left—
LONG AVENUES OF BREN GUNS

Here Bren guns for the Army are assembled in long, shining avenues at an armament factory, typical of the way in which various types of weapon are rolling up in heartening quantities. All types of workers are feeling the urge to help in the great effort before the nation. Girls of seventeen are working shoulder to shoulder in the production of arms for our fighting men. Many of the girls are working twelve hours a day, and the men are putting in seventy hours a week. Many of the machines are never idle day or night throughout the seven days of the week

FOR VICTORY

FRENCH ARMAMENT WORKS ARE POURING OUT THE VITAL METAL, STEEL, IN EVER INCREASING QUANTITY

For the first time British Press photographers have obtained permission to record the work going on in French shadow factories. The majority have only taken over armament work since the war. In many, French women do much of the work, at times working ten hours per day

On right—
MOULDING SHELLS IN FRANCE

In this picture taken by a British Press photographer shells are being moulded in a special mixture of cement and sand. The moulds are used once and then broken up. In these French munition works, a great number of women work in the departments where the actual parts handled are comparatively small. Women in some cases work two full weeks, with one week off; this in the case of married women helps them to go shopping, and to keep the home in order; everybody is working all out. 1,700,000 men and 800,000 women are working on armaments in France

BEFORE THE BELGIAN SURRENDER

War Pictures from the Western Fronts

BLOWING UP BRIDGES AS THE GERMAN TANKS CROSSED BELGIUM

Uncertainty as to the exact moment when bridges should have been blown up led in many cases to the enemy pouring in his armoured attack, but in this case the B.E.F. blew up a Belgian bridge with timely effect. The broken bridge is shown *below* after the demolition

THE FRENCH TANKS ROLL UP TO THE SOUTHERN LINES

This little town has been attacked by German raiding bombers. Certain houses of a domestic type have been knocked out. Tanks and soldiers alone are visible

FRENCH MOTORISED TROOPS MOVE TO THE NORTH

Here in sunny France, bursting with May-time foliage, is a column of armed motor-cycle combinations waiting the word to proceed towards the front. *Below*—A file of British soldiers moving into position

A GLIMPSE OF PART OF THE LINE HELD BY THE B.E.F. IN BELGIUM

In spite of the difficult position in which the British Expeditionary Force had been placed by the intrusion of the Germans through the Bapaume gap, the line was held with tenacity and an attack on a German position near Aire was mentioned in the French dispatch of Monday night. Trenches and protective works had been made in this stretch of flat open country, with a low ridge of woodland beyond. The men were having an alfresco meal beside this little country road—the box was evidently full of eatables of various kinds

BRITISH SOLDIERS FIXING THEIR CAPES FOR ONE ANOTHER IN A BOMBED BELGIAN TOWN BEFORE THE RETIREMENT FROM THE LYS

These British Tommies were standing in front of a domestic residence which had received a direct hit shortly before this picture was taken. The scene was one which had become all too familiar in the path of the German forces. They have bombed and burned their way towards the coast. Certain villages have been mercilessly attacked

INTERROGATED BY A FRENCH OFFICER AFTER BEING CAPTURED

Two German flying men are here seen standing before the French interrogation officer of the Armée de L'Air. Both wear badges of rank on collar or shoulder strap—three wings on the left, one wing on the right. Quite a number of aviator prisoners have been made in comparison with those made wholely in connection with the ground

GERMAN FLYING MEN Become PRISONERS OF WAR

BOOTED AND GAITERED, THESE GERMAN FLYING MEN REACH LONDON

This group of German flying men arrived last week at a London terminus. They, like the men shown above, wore badges of rank—a single eagle or two or three as the case may be

MORE GERMAN AVIATOR PRISONERS ARRIVE AT A FRENCH DETENTION CAMP

The German pilot officer on the right is tall and slim in strong contrast to the man in stockinged feet, who is of lesser rank. All the German aviators appear to be heavily booted. They wear a "half-boot" with strap at the top

FIGHTING THE TANK

Two of Our Army Weapons
Described by DONALD COWIE

THE ANTI-TANK RIFLE (*seen on left*) is a heavy weapon with a very big kick. It is planned to be fired from the ground. Hence the rest, shown in the above view. (The man on the right is carrying a **BREN GUN**)

THE ANTI-TANK RIFLE: Drawing a Bead on the Land Battleship

IT is a curious reflection to-day that it was the Germans who first had to think of a means of disabling the tank. After much experimentation they devised, sometime in 1917, a large, heavy rifle, which fired a heavy armour-piercing bullet. The only snags were that after a few rounds it became too hot to hold, and the rifleman was incapacitated with a bruised shoulder from the tremendous recoil. Then a machine-gun was devised to fire armour-piercing bullets. This was not very successful.

Out of those desperate enemy improvisations against our surprise weapon of the tank has been evolved our modern anti-tank small-arm armoury, which ranges from quick-firing, heavy-calibre rifles to special machine-guns.

The latter, such as the Bren, the French Hotchkiss, the American Browning and the Italian Fiat are usually about ½-in. calibre, and they can theoretically penetrate ½-in. armour at 500 yards, firing 450 to 1,000 rounds a minute.

The anti-tank rifle proper is a slim, long-barrelled weapon, devised to be fired from the ground. The projectiles are, technically speaking, small shells. These are intended to pierce the armour of the tank, burst inside, and cause havoc in the small space. The action is automatic. The recoil, very heavy from such a projectile, is taken up by a spring or buffer, so that the piece is not displaced, and steady, accurate shooting can be obtained. Such rifles are to be found in all modern armies.

Since the Germans have been using exceptionally heavy tanks, with very thick armour protection, it is not difficult to see why the anti-tank marksmen of the Allied forces were unable to make much impression at the beginning.

It is important with heavy anti-tank artillery that good positions should be chosen, that guns should be deployed in large numbers in the path of the onslaught, and that projectiles should hit their mark square-on. This is still more important in the case of the anti-tank rifle and machine-gun. The power of penetration is so much reduced by a slanting shot, even at an angle of 60 deg., that the light bullet will almost certainly ricochet off.

Undoubtedly the full story of the events in France and Belgium during the past week or two will afford valuable material for readjusting ideas about these light anti-tank weapons. Until that full story is received, however, it is best to preserve, still, an open mind.

THE ANTI-TANK GUN has to be carried with a knack. You grasp what looks like a sword handle, balance the thing nicely on the left shoulder and hope for the best. It fires off what is technically a shell

THE ANTI-TANK GUN: The Use of Artillery Against Tanks

THERE are three kinds of special anti-tank weapons — first, artillery; second, one-man guns usually referred to as "rifles"; and third, armour-piercing machine-guns. The most effective are naturally the larger pieces. Against heavy tanks with very thick armour, such as the Germans have been using, they are probably the only weapons upon which our men can safely rely. What are their special characteristics?

The British Army has developed chiefly a 2-pdr. gun for anti-tank purposes. It is an extremely mobile weapon, as demanded by the nature of its duties, and is mounted for transport on wheels with pneumatic tyres. But for action these are instantly removed, and long, folding legs are pulled out to make a flat tripod.

The mechanism of these legs is exceedingly ingenious. There are leg-locks, and spiked feet to hold the ground. Joints are hinged for retractability. The gun can thus be ready for action in a few seconds. It can be swung on a wide arc by the gunner—360 deg. of freedom—and it carries with it in every forward direction a strong bullet-proof shield, the top part of which is hinged and contains a slotted sight. Behind this the layer takes his sight and the loader prepares for action with ammunition box attached to the gun on his right-hand side. The third member of the crew stretches out on the ground at the other side to command operations. He is a non-commissioned officer. Two other men are usually attached to the crew for ammunition-carrying and dispatches.

The snag with so many military operations is that they take on a completely different complexion under fire, as our anti-tank men have undoubtedly found in the last week. However, given that perfect tableau, our 2-pdr. anti-tank gun should be capable of firing about fifteen shells a minute. It is, of course, intended for point-blank work, so there is no range-finder, a flat trajectory is usually taken, and non-explosive shells have hitherto been used. They are presumed to be capable of piercing the thickest known tank armour. Therefore it is important that they be properly mounted in the flat path of the oncoming tank. Indeed, the proper placing of this kind of artillery is half the battle won.

I have watched these guns at work in England, and they have really seemed remarkably efficient—or our gunners have appeared to be very good shots after a few months training. In reflecting upon recent events in Belgium and France, however, it must be considered whether, in the first place, many of these guns were available at the vital points, and properly placed. It must be mentioned that the large anti-tankers are usually organised as separate units under the higher control of brigades or divisions.

Our 25-pdr. "gunhow" would be very useful against the really large tanks which passed through the ranks of the smaller guns unscathed. This weapon can be used as a high-velocity gun with very long range as well as a howitzer and it has a ground-wheel which enables it to be swung rapidly in any direction. If there are many of them in the face of the German advance then it is certain that they will have been used with thankfulness by our men. The whole point about anti-tank artillery, however, is that it *must* be properly concentrated in the line of advance of the tanks, with adequate anti-aircraft protection. Then it will probably be successful against the heaviest tanks.

THE ANTI-TANK GUN, to be fired to best advantage, requires to be dismounted in this fashion, but whether this was possible in the very rapid conditions of last week's fighting has yet to be learned. Everything practised at home was put to a violent test under the fierce attacks from the air

The gunner of a **BRITISH ANTI-TANK GUN** has a large measure of protection against land fire in the hinged shield shown here. He ranges on his target through a slot, and doubtless has learned much as to the vulnerable or non-vulnerable points on heavy tanks during the past few days

b

THE BATTLE OF THE

A TREE OBSTRUCTION ON ROAD: Trees have been rapidly felled and allowed to fall across the roadway, while in the middle distance a group of vehicles further blocks the onward rush of any German mechanised column which may decide to dash down this road

A FRENCH HEAVY TANK WAITING AT A ROAD JUNCTION: Here is a French heavy tank awaiting a possible rush of armoured forces. It is ready to open fire while the enemy is held up

A PROCESSION OF BIG FRENCH TANKS ADVANCING TO THE FIGHT: In the war of tanks the heavy French type has been fighting bravely in the great

THOUGH it is not likely that we shall be troubled much by German tanks landing in this country, it has been claimed that small tanks and small field guns, sometimes in sections, can be transported by their large planes. Cases have been reported of local inhabitants of undefended places in France and Belgium failing, due either to panic or insufficient initiative, to make any obstructive efforts to destroy or delay German tanks which have passed through.

In permanently defended or fortified areas, provision of anti-tank devices against tank attacks takes various forms apart from land mines. There is the deep, and steep-sided, concreted tank trap, or pit, which may be camouflaged or placed so as to present a surprise to the enemy. Once the tank has dived headlong into this pit, or trench, it is impossible to get out again, and, whether seriously damaged or not, it is rendered helpless.

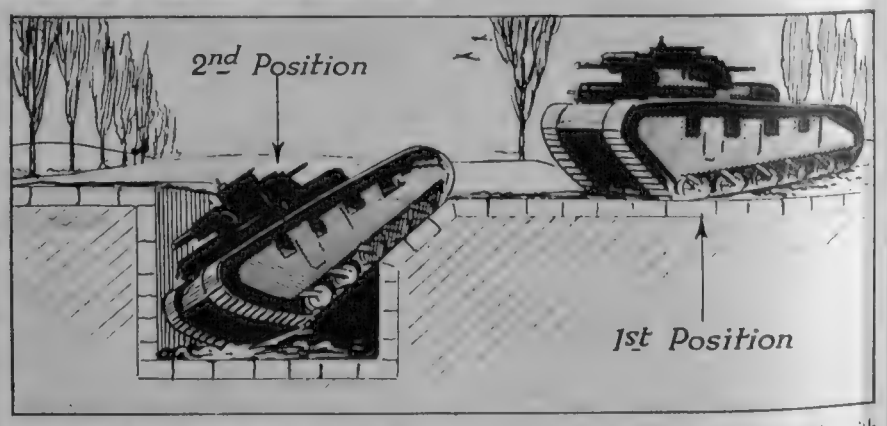
In other cases, old steel rails are stuck vertically in irregular rows in the ground which is likely to be covered by an attack, and embedded in concrete, the rails projecting four or five feet above ground. Tanks trying to get over these will very soon have their caterpillar track broken, or sufficiently damaged to be unable to proceed. Sometimes stout timbers, or tree trunks, are used in a similar manner.

A form of obstruction used by the Germans is made up of thousands of inverted wedge-shaped blocks of concrete, sometimes called "dragon's teeth," which are embedded in the ground in staggered rows. Still another method has been to use steel rails made in a sort of inverted bracket form, in which curved-up rails form a surface on which the tank track can get no grip.

A FRENCH LIGHT TANK WATCHING ON ROAD: These speedy tanks should prove valuable in fighting their own kind and in stopping an armed motor-cyclist rush

On left—**A TYPE OF FRENCH TANK OFFICER** standing in front of his colossal mount

AN ANTI-TANK GUN POST: Watch is being kept on a long tree-lined road in France. Will they come this way? In the meantime, a few pedestrians and cyclists are carrying on with the day's task. The rapidity of the German advance and the air observation made the task of road guarding very difficult at first



Above—**THE MOAT TYPE OF TANK-STOPPING DEVICE** is a useful one if properly placed or disguised. If the tank can by artifice be lured into it, it becomes quite immovable except with elaborate hoists. It is the old idea of a dry moat

On right—**DEMOLISHED HOUSES** with masses of fallen masonry and brick, heavily-laden carts with broken wheels, and boilers, cisterns and heavy furniture all provide a rapid means of retarding a rush of mechanised armament

TANKS: With the French Heavies, and Some Methods of Stopping an Enemy Rush

task of exhausting the enemy's rush. In the middle distance they can be seen crossing this stretch of heathy country on the way into the melee

In the case of undefended towns and roads, where hasty preparations of a makeshift nature have to be improvised, these would depend on whether in town or country, the access to explosives of any kind, and other factors. Where the advancing tanks of the lighter types have to pass through a town, it should often be possible to barricade the streets by various methods. If powerful explosives are not available, local road rollers, traction engines, or motor lorries loaded up with bricks or stones might be rushed into a big pile-up, and even a few collisions made to effect a proper mix up.

The lighter tanks of from 5 to 16 tons will have difficulty in surmounting well heaped up obstructions from over 2 to 4 ft. in height respectively. Again, railway sleepers, heavy timbers, and logs from the nearest railway depots, or sawmills, or building yards, with some heavy furniture from damaged houses, might be piled up several feet high.

Where reasonable quantities of explosives were available the methods adopted would be much more effective. Houses could be demolished into the street, blocking it up, or explosives hidden in the barricades. Booby traps of various kinds, camouflaged or hidden just below the road surface, might be placed on the road.

In country places, suitable materials might not be available, but if it was a matter of only blocking a road, off which the nature of the country made it impracticable for the tanks to travel on either side, farm tractors and wagons might be piled up, tree trunks laid across the road, or deep, wide ditches dug across the path and lightly covered in an unnoticeable manner. In one case recently reported the French rolled great cable drums, which happened to be near, on to the road.

HOW TANK TRACKS ARE PROTECTED: The track is a vulnerable part of a tank, as was evidenced in the way in which some British pioneers successfully attacked a couple of enemy tanks with pick and shovel while the tanks were refuelling at a roadside petrol station

A HUGE FRENCH TANK pushing up to the midst of the fighting zone. It is just passing part of a barrier of metal rails now dragged to one side to admit of French movement

On right—**A TYPE OF FRENCH TANK OFFICER** who has been fighting bravely in Northern France against heavy odds

BRITISH WHEEL BASES exhibit many varieties for special needs, witness these two above, and the one given below with its six smooth-rimmed wheels

SHRAPNEL FIRING FROM THE PROTECTION OF A WOOD

The officer observing the range finds the white puffs of shrapnel, bursting over a distant position, very helpful in obtaining the accurate ranging necessary for the effective use of shrapnel shell

SHRAPNEL : A Useful Adjunct to the Artillery's Armoury which might Still be Employed with Effectiveness To-day

By CAPTAIN DONALD ANDERSON

PERHAPS the most conspicuous feature in a battle-landscape of the last war was the line of white smoke puffs—often merging into a solid cloud—put out by shrapnel shells bursting overhead in a barrage. Fountains of dark earth thrown up by high-explosive shells also helped to complete the picture, but they remain in the memory as less characteristic of the scene. In battles of this war the dark fountains of earth are likely to preponderate over shrapnel's fleecy puffs; yet shrapnel may still have its opportunities.

Before considering why these two kinds of projectile have changed in relative popularity, it would be well first to consider their natures, functions, and effects.

A high explosive shell consists of a cylindrical steel case filled with a high explosive charge which, when ignited (by impact or by a time-fuse), shatters the case into a thousand fragments. The shell's destructive effect is caused by these flying fragments and by the sudden outward pressure of air set up by the explosion. Fragments of H.E. are sometimes, quite erroneously, referred to as "shrapnel."

Shrapnel (named after the British Army officer who invented it at the beginning of the nineteenth century) consists of a cylindrical steel case, of thinner metal than a H.E. case, which is filled with two or three hundred spherical lead bullets. On the nose of the shell is a cap containing a fuse, which begins to burn at the moment the shell is fired from the gun. When the shell has travelled its appointed distance through the air, a flash of fire is shot from the fuse down a tube running between the bullets along the axis of the shell. At the base of the shell this flash of fire ignites a handful of black gunpowder, which explodes to throw the leaden bullets forward out of the case. The bullets spray out onwards like water from a rose-nozzled garden-hose. Their speed of flight is that of the projectile plus the added impetus given by the bursting black powder.

Black powder is used because it gives forth white smoke, which is visible from a long way off and enables the artillery observation officers to correct the aiming of their batteries. Unlike H.E., the cylindrical case of a shrapnel shell is not designed to burst; its work is done when the bullets have been projected from it; but unhappy is the man who interrupts its course towards the earth. As it falls it sets up a rather pretty singing note.

A useful little 4·5 howitzer which could be used for firing shrapnel shell when conditions of open warfare call for its use

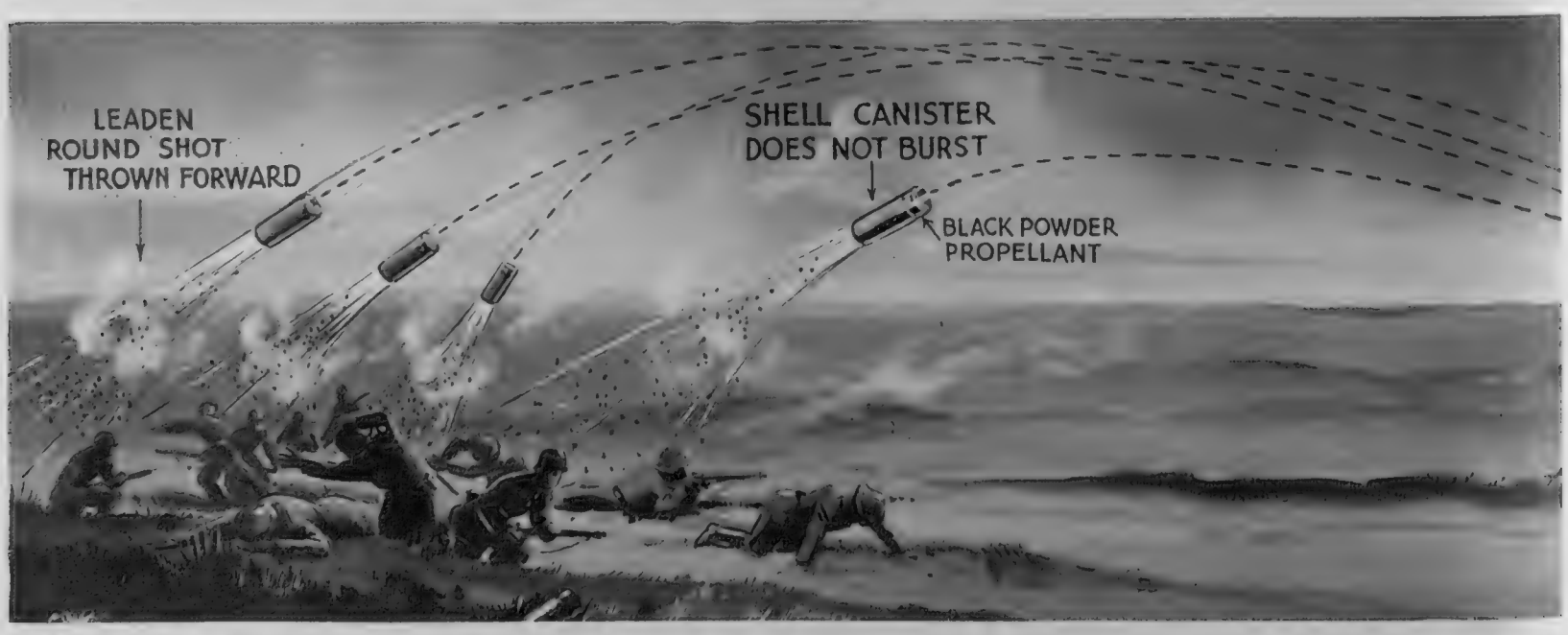
So we see, shrapnel's effect is forward only, and it can do damage only to soft-skinned targets, such as men and horses, for its leaden bullets' penetration is less even than that of rifle or machine-gun bullets.

High explosive, on the other hand, bursts with equal effect in all directions; and it bursts with much greater violence. For the latter reason it can damage armour-plate, concrete, and sand-bagged trenches, against which shrapnel would patter with hardly more effect than summer rain; it can also dig up and tear down barbed-wire entanglements, which will stand unscathed against any quantity of flying shrapnel.

Aeroplanes are soft-skinned targets; yet H.E. has superseded shrapnel as the more effective anti-aircraft projectile. One cause of the change here is that shrapnel's effect is forward only. Thus a shrapnel shell bursting beyond the aeroplane it was fired at would do no damage, because all its destructive force would go away from its target, whereas a H.E. shell bursting in the same place would expend some of its force backward on to the target.

The change-over from shrapnel to H.E. against ground troops is one of the results of mechanisation. Until 1918 we were accustomed to reckoning the strengths of armies by counting the men they contained. Now we reckon in fire-power, that is, we calculate an army's strength by counting up its weapons, the weights of the projectiles they throw, and the strength and speed of the armoured vehicles which carry them. Therefore, artillerymen in 1914-1918 were mostly concerned with destroying men; in 1940 they are mostly concerned with destroying machines. Shrapnel bullets bounce off machines; high explosive twists and tears them into uselessness.

The occasion still remaining for the right use of shrapnel is when the artillery's target is unarmoured infantry in the open; for such troops have not yet fully disappeared from the battlefield. Whether the men are erect in advancing or retiring, or are lying down in defence, they are liable to suffer more damage—shell for shell of the same weight—from shrapnel bursting just short of their positions to shower lead down upon them than they are from high explosive bursting on impact and wasting more than half its effect in blowing out a hole in the ground.



"SHRAPNEL" SIGNIFIES A SHOWER OF LEADEN BULLETS, NOT BROKEN PIECES OF HIGH EXPLOSIVE SHELL

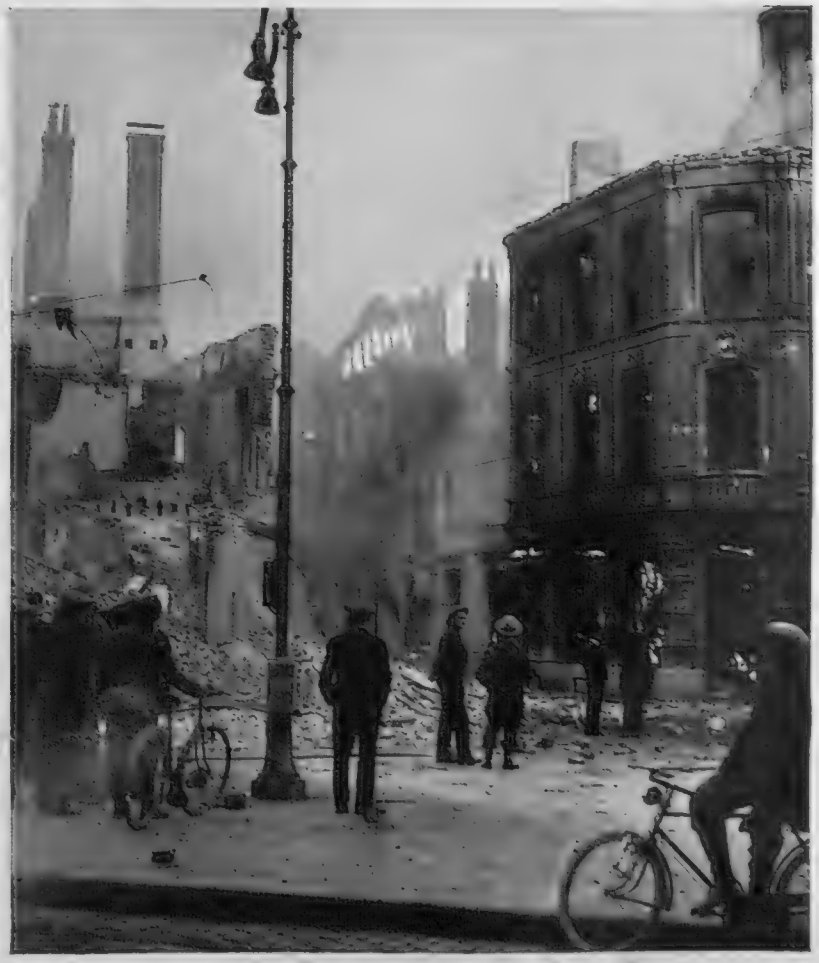
Shrapnel shells discharge a shower of leaden bullets in a forward direction and are extremely useful when the target is exposed. The canister does not burst but whines its way to the ground after the black powder propellant has blown forward its shower of leaden bullets

IN STRICKEN BELGIUM:

The Devastating Effects of the German Aerial Bombardment of a Belgian Border Town

A FLEMISH PICTURE OF THE HAVOC OF WAR AS WAGED BY NAZI BOMBERS: A vivid picture of Belgium's sufferings under the Nazi air invaders has been given to us by the British correspondents and camera men who were in Belgium at the beginning of the strategic retreat from the first Allied line. They describe the bombing of Louvain, almost deserted, with but a few inhabitants left behind, as in the picture given above. In many cases the houses knocked out by the bombs are just domestic residences of the character shown above. In another town near the Belgian border the correspondents were standing in the old square, with its stone houses picked out in gold, when the raiders came over. The journalists flattened themselves on the ground at the base of the clock tower, and escaped being hit by a few yards; but a comrade busily writing in his hotel room was blown against the wall. Outside they saw at first hand the dead and injured, many of whom were women and children

THE B.E.F. ON GUARD IN A LOUVAIN STREET: The deserted thoroughfare has been bombed—bricks are scattered in profusion on pavement and road. The men are resting on some of the furniture left behind by the fleeing citizens



FIRE BREAKS OUT IN A BELGIAN TOWN: Fire is one of the troubles which follow in the wake of the Nazi bombers. It is recorded that some twenty houses were burned out alongside the old square described above

WHAT HAPPENS TO A BOMBER WHEN IT IS SHOT DOWN—ALL THAT REMAINS OF A GERMAN AIRCRAFT BROUGHT DOWN BY FRENCH FIGHTERS

THIS BOMBER, TOO, EXPLODED WHEN IT HIT THE GROUND: THE DEBRIS WAS SCATTERED FAR AND WIDE, AND ONLY THE TAIL PORTION WAS INTACT

A GERMAN HEINKEL 111 BOMBING PLANE, ON ITS WAY TO BOMB FRANCE, WAS BROUGHT DOWN BY FIGHTER AIRCRAFT. IN THIS CASE THE LOAD OF BOMBS ON BOARD DID NOT EXPLODE

THIS GERMAN AIRCRAFT APPARENTLY MADE A GOOD "CRASH" LANDING WHEN IT WAS BROUGHT DOWN. IT IS NOT UNLIKELY, IN THIS CASE, THAT THE CREW WERE CAPTURED AS THE CABIN STRUCTURE IS QUITE INTACT

ONE OF THE MUCH-LAUDED MESSERSCHMITT 110, WHICH OBVIOUSLY SOMERSAULTED WHEN IT TOUCHED GROUND AS ITS WHEELS ARE FULLY EXTENDED

Into this office every day comes a stream of photographs of all kinds and from all areas: not all of these are retained for publication—yet, in selecting the above five pictures, it was found that there were no fewer than thirty-nine showing crashed or wrecked enemy planes. And these have all been received within the last few days, and have come only from parts of France where photography is safe! It will readily be appreciated, therefore, that the number of aircraft destroyed in action must be very considerable. It is interesting to observe in the selection of pictures reproduced here—and in those from which this selection was made—the various states of destruction. Many of the bombers were literally blown to pieces when they struck the ground as the result of concussion which detonated the bombs; others were capsized and somersaulted, possibly owing to injuries to the pilot; and others, again, seem to have made quite good "crash" landings on their "bellies"

THE WAR IN THE AIR

RECIPROCAL BOMBING; and PARACHUTE TROOPS

By CHARLES G. GREY

(Founder of *The Aeroplane*)

NOW that we have started bombing German territory instead of the territory of our Allies, we must expect to be bombed in our turn So we may as well face up to it. And, having made up our minds on that, let us compare the weapons on the two sides. Reciprocal bombing will begin with such machines as both sides have already. Our bombers, as the world knows, are the Vickers Wellingtons, the Armstrong Whitworth Whitley, and Handley Page Hampden. And we have that extraordinarily fine all-round aeroplane the Bristol Blenheim and its successor, the Beaufort, which is faster than the others. The enemy's best bomber is the Heinkel 111 and its successor, the 111K. After that there are the Dornier and Junkers. Also there are a few big four-engined monoplanes of the type of the Junkers Ju 90 and the Focke-Wulf Condor.

A few years ago there was a craze for big aeroplanes in Germany, just as there was in America when Boeings produced the much-boosted "flying fortress." When General Udet was made technical chief of the *Luftwaffe*, as a first-class fighting pilot he saw that they would be flying targets rather than flying fortresses, and told the makers to offer them to the world as air-liners. They have been used for troop-transport in Holland and they would be useful as bombers against a wholly undefended country. But when one considers the loss if one of these machines were hit by a lucky anti-aircraft shell or by a skilful fighter, one sees the sense of General Udet. The theory was that they could get up so high with oxygen for the crew, or even a pressure-cabin, that they would be out of reach of anti-aircraft guns and high-speed heavily-loaded fighters. When one remembers how the Boeing stratosphere machine, full of passengers, fell to pieces apparently because an airscrew broke (the stratosphere pumps were not working, so cannot be blamed) one rather loses faith in "flying fortresses."

The comparison between bombers may most simply be made on horse-power and total loaded weight. First-class aircraft designers of all nations achieve so nearly the same results for the same horse-power and the same weight that there is seldom much difference in their petrol consumption, and consequent range, for a given horse-power, or in the structure-weight and the consequent useful load in petrol and bombs. Therefore, the following figures are interesting. They were all published before the war and have duly passed the Censor for export, so readers need not think that I am being indiscreet.

The Wellington has 1,750 h.p. and weighs 24,850 lb. all up. The Whitley has 1,980 h.p. and weighs 25,900 lb. The cruising-speed of both is about 215 m.p.h. The Hampden has 2,000 h.p., weighs about 21,000 lb., and has a cruising speed of 212 m.p.h. The Bristol Blenheim has between 1,500 and 1,700 h.p., it weighs 12,050 lb., and its speed is round about 300 m.p.h. Consequently it is much the fastest bomber and has been very successful as a multi-gun twin-motor fighter. Its successor, the Beaufort, is an enlarged version of it with much more power and a higher speed, and presumably a bigger bomb-load.

The Heinkel 111 (Mark V) of 1938, which is the most used German bomber, has 2,300 h.p. Like our Blenheim the top speed is approximately 300 m.p.h. (cruising 257) but its weight is 27,250 lb., which shows that it is a bigger machine than either our Whitley or Wellington. On the other hand, it is not so well armed. The Heinkel 111K, a later product, also has 2,300 h.p., its weight is 27,400 lb., and its speed is about 230 m.p.h. Incidentally, the speed of 300 m.p.h. given for the He 111 is that when the upper and lower gun positions are retracted into the body of the machine. When they are pushed out to fight they take 30 m.p.h. off the speed and they are nothing like as good as the hydraulic turrets on our Whitleys and Wellingtons.

The Dornier Do 17, of which Germany seems to have hundreds, if not thousands, has 2,200 h.p., weighs 14,100 lb. and cruises at about 270 m.p.h. A rather curious thing is that we have heard nothing so far in this war about the Dornier Do 215, which also has 2,200 h.p., weighs about 19,000 lb. and has a speed of fully 300 m.p.h Perhaps our people who have seen it in the air have not been able to distinguish it from its ancestor, the Do 17.

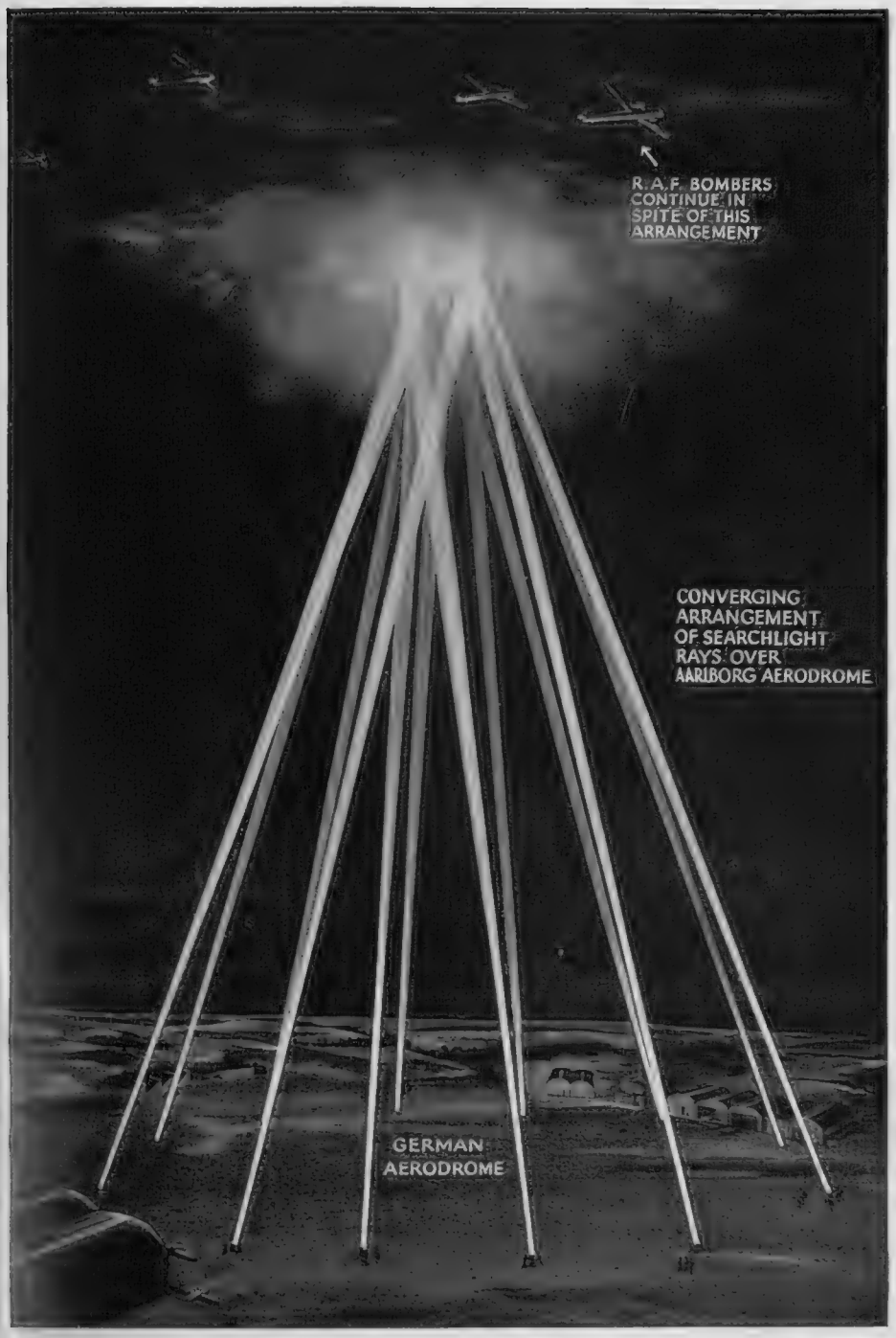
The Focke-Wulf Condor has about 2,900 h.p., weighs 32,120 lb., and has a speed of about 220 to 230 m.p.h., so it is nothing alarming. The Junkers Ju 90 (it is supposed to carry forty passengers) has about 3,300 h.p., weighs about 50,500 lb. and its speed is less than 200 m.p.h. Probably the Germans have put in engines of 1,100 or 1,200 h.p. instead of the 840 h.p. with which these big machines were fitted. And an extra total of 1,000 to 1,200 h.p. would put up the speed, but would not make them any less vulnerable. Perhaps the most important thing to remember is that if the Germans try to use their single-motor Junkers 87 dive-bombers on our towns they will find the balloon barrages inconvenient and also they will be full in the blast of all our best fighters.

Against some German bombers the biplane fighters of the previous generation, such as the Hawker Fury, might do well, as the little Italian Fiat biplanes did in Spain against the Red Russian bombers. Certainly when one has seen brand new aeroplanes hanging in a row by the tail like herrings one does not feel nervous about the number of fighters available. Nor, when one considers the number of people in the advanced training schools who are asking nothing better than to be let loose in fighters against the German bombers there is no doubt about the quantity or quality of men available. But, as Marshal of the R.A.F. Sir John Salmond said years ago, when he was Chief of the Air Staff, some bombers will always get through. And we have got to face that fact

This Royal Air Force Flying Officer has just landed in France after bringing down two enemy aircraft during the recent fighting over the "Bulge"

A famous New Zealand tennis star, now a pilot in an Auxiliary Squadron—a picture taken just after his return from a dog fight in France

Flying Officer Orton, just awarded the D.F.C., who has shot down five enemy aircraft. A brother officer and in the same squadron as "Cobber" Kain



IS THIS A NEW TECHNIQUE OF THE GERMAN GROUND DEFENCES? When a raid was carried out by the R.A.F. at the beginning of the month on Aalborg Aerodrome (Denmark) no attempt was made by the ground defences to catch individual aircraft in the beams of the searchlights. Anti-aircraft fire and searchlight activity were, in fact, intense; but the searchlight beams came up in a fixed position, converging over the centre of the aerodrome in an apparent attempt to blind the bombers and confuse their aim

that if an enemy is found in plain clothes he is liable to be shot as a spy, but only after proper trial. But if he is wearing uniform under his disguise then he is not a spy. One of my friends used to wander about in what we called Hunland, otherwise the area in France occupied by the Germans, wearing a French peasant's dress over his uniform. I imagine that many other British officers did the same. How many and what happened to them when they were caught is known only to our Military Intelligence.

Some of the stories which have come to us from Holland and Belgium about these parachutists are quite interesting. One is that a parachutist who landed was surprised that the people seemed hostile. Presumably he had been told that he was going to land among a friendly people who would be glad to have his help to protect them against the Allies. That, no doubt, is the story that all of them are told, except those who landed in Belgium behind the fighting line, and they were obviously sent to fight.

Another tale which may well be true but could easily have been invented is that some of those who were captured appeared to have been doped. There is nothing new in doping fighting men. Anybody who fought in the last war knows what the effect of the rum ration just before zero hour was. And quite early in that war we were told of German troops going into action arm in arm drunkenly. That was before the days of low-flying aeroplanes and plentiful machine-guns. On the other hand, the apparently doped parachutist may merely have hit his head on the ground when landing.

Yet another story is that in Holland the Germans dropped pit-ponies to carry heavy machine-guns or ammunition. At the time of writing, I have not seen that story on paper but it was told quite solemnly by an intelligent friend of a friend of a friend of the woman who saw it. The Italians dropped sheep and goats by parachute to feed their troops on that extraordinary desert march across the waterless, foodless country on the direct route from the sea to Abyssinia. And many of the animals came down without breaking their legs, so the scheme seems possible.

Yet another story was that of a woman who said that the Germans were using transparent parachutes so as to escape observation. She did not suggest that they were also using transparent men and armament. But the yarn does suggest that the Germans may be using some practically transparent form of artificial silk, whereas we, being us, use nothing but the very finest quality of Japanese or Milanese silk. I suppose there are other sorts of silk, but the official mind would probably take as long to change from genuine silk to artificial silk as it has done to change from linen fabric for aeroplanes to cotton, which has been used by the Americans for many years. And we have not done it yet, although cotton is said to be just as strong and to give a smoother surface and therefore to make a faster aeroplane.

Just as a closing note, let me point out to those people who are gravely concerned lest the Germans use aerodromes in Norway and the Low Countries as bases for attacks on us, that from Holland to England is no nearer than from England to Holland. If we had to make heavy bomb raids on Dutch or Belgian aerodromes, which are very small and unsuitable for big bombers except three (Schiphol, Walhaven and Brussels), our fighters could escort our bombers, which cannot be done on long-range raids with our regulation defensive interceptor fighters.

One of the minor mysteries of this war is why, now that we have been forced to bomb the aerodromes and consequently to damage the adjoining property of our friends in Norway and Holland we have not knocked the stuffing out of the German aerodromes just behind Holland. They were put there originally as training establishments to keep the pupils as far away from the Russians as possible in the days when every good German used to think that Russia was their only enemy. That was when a German friend of mine, when I chaffed him about the intense care they were taking about A.R.P. shelters at his factory, replied, "But we are 800 miles nearer Moscow than you are." I often wonder what Germans of that type think about the present situation.

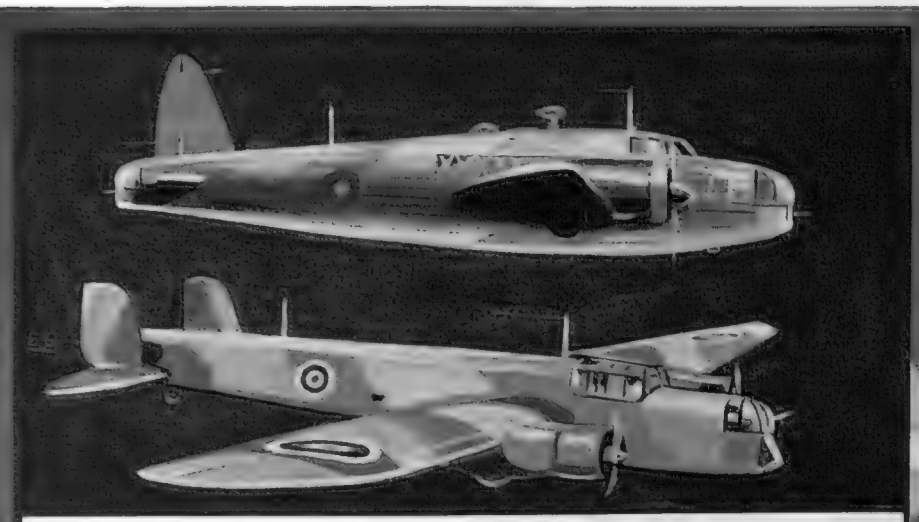
NOW LET US TURN TO THE PARACHUTE TROOPS. There is little fear of a parachute invasion of this country. Any attempt at such a thing would bring the old Junkers air-liners which are being used as troop-carriers into the zone of our protective fighters. In fact, they could be shot down by pupils of our advanced flying training schools while our better equipped and more highly trained fighter pilots tackled any fighter escort which might be sent over with the troop-carriers.

An unnamed Flying Officer with the R.A.F. in France who had just accounted for a Junkers 88 and a Dornier bomber when this picture was taken

The greater danger, so far as parachuting is concerned, is the dropping of spies and of special men detailed for sabotage. They would be much harder to trace and much harder to catch. During the last war our people used to drop spies with parachutes far behind enemy lines. Generally they were Frenchmen, but a goodly number were British officers.

Which introduces another point, namely,

HOW THEY ARE DETAILED FOR THEIR VARIOUS DUTIES FOR THE DAY: The Wing Commander (second from left) in the presence of the Group Captain (with "brass" hat, extreme left) gives the crews their "briefs." An officer of the Royal Australian Air Force attached to the R.A.F. may be seen in the centre of the group. This picture was taken a few days ago at a home aerodrome in England



WHITLEY (*below*) and **WELLINGTON BOMBERS** (*above*) of the Home Command have bombed enemy transports near The Hague. They have also been making a series of heavy attacks on enemy communications in Germany and Belgium

SUPERMARINE SPITFIRES, based in England, flew to the Low Countries for combat; after engaging the enemy aircraft they returned home, refuelled and rearmed, and then went forth again to battle

BOULTON PAUL DEFIANTS went into action for the first time off the Dutch Coast during the German invasion of Holland and shot down Junkers 88 transport planes

BRISTOL BLENHEIMS an

NORTH SEA

BOMBED COMMUNICATIONS IN GERMANY

BOMBED ENEMY TRANSPORTS NEAR THE H

FLEW OUT TO ENGAGE ENEMY PLANES

EAST ANGLIA

RETURNED FOR REFUELLING

BOULTON PAULS MEET JUNKERS

FOU ENEM

FRANCE

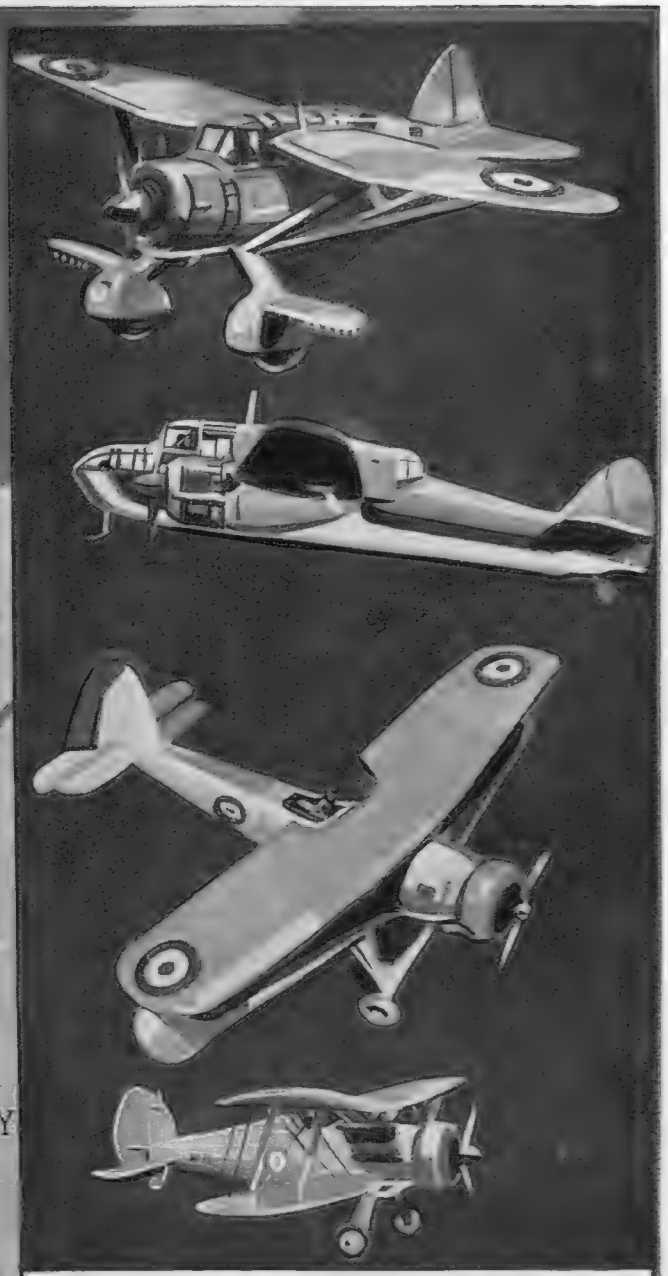
EVERY BRANCH of the R.A.F. in ACTION

A Diagrammatic Exposition of all the British Aircraft Now Engaged in France and Belgium, and How They Have Been Operating

DRAWING BY ROLAND DAVIES

Now that the war has come so close to Britain i has been given to the whole of the Royal Fleet Air Arm to participate to the fullest exten fighter aircraft based in England now being owing to the proximity of the fighting area days of the present campaign, during the Low Countries, the R.A.F., in conjunction branch of our air services, the Fleet Air A against the invading Germans. For the first aircraft flew from their home bases, engaged the the theatre of war, and returned for refuelli

BLACKBURN ROCS and **BLACKBURN SKUAS,** dive-bombers of the Fleet Air Arm, operated off the Dutch Coast



Other types of planes—**WESTLAND LYSANDER II'S, BRISTOL BEAUFORTS, FAIREY SWORDFISH,** of the Fleet Air Arm; and **GLOSTER GLADIATOR** biplanes (top to bottom)

MS and **FAIREY BATTLES** flew from France and attacked German troop concentrations, military convoys, railways, bridges, etc.

HAWKER HURRICANES and **SUPERMARINE SPITFIRES,** based in France, protected the Allied troops as they moved into Belgium

itain itself, an opportunity Royal Air Force and the extent—even short-range eing able to participate areas. In the earlier the invasion of the ction with the newest Air Arm, did fine work first time our fighter d the Nazi bombers over efuelling and rearming; and then set off again for further combat. Special credit must be given to our pilots for the splendid protection they afforded our troops moving up into Belgium; and for the support they are, at this moment, giving by bombing enemy concentrations and troop columns behind the fighting forces. The Air Force have shown, indeed, that they too understand the meaning—and the implications—of "total warfare." As the enemy has utilised every type of aircraft he possesses, so have we retaliated with every machine we can muster—from the very latest Boulton Paul Defiants (which made their first war-time appearance over Holland) to the old style Gloster Gladiator biplane fighters (which had already distinguished themselves over Norway), and the still very potent Fairey Swordfish of the Fleet Air Arm. During last week the mêlée in the air became general, and on all fronts the Allies were hitting back—and hard. There is no question here of a walk-over, as in Poland and Norway and Denmark: the Allies have Air Forces capable of giving blow for blow—and more. And this must be a new experience for the Luftwaffe, which has hitherto found itself up against very little opposition. In the above diagrammatic exposition all the types of British aircraft which have been participating in the fighting are represented, together with the approximate routes by which their attacks have been delivered

ITALY'S FLEET: An Examination of a Navy very Proud of Its Cruisers and Its High-speed Motor Craft

By FRANK BOWEN

A RECONSTRUCTED ITALIAN BATTLESHIP, THE "GUILIO CESARE," ONE OF FOUR SIMILAR VESSELS

Originally completed in 1911, this battleship has been radically reconstructed between 1933 and 1937. Her armament consists of ten 12·6-in. guns, twelve 4·7-in. guns, eight 3·9-in. anti-aircraft guns and thirty-six machine-guns

THE situation in the Mediterranean, and the very belligerent pronouncements of a number of Italian statesmen, make the Italian Navy of the greatest interest at the moment, although it is not easy to get a true picture of its actual condition on account of the very careful screen of secrecy that was put round everything concerning the Italian Navy and Merchant Service some years ago and which has never been lifted, a screen which makes the constant propaganda that has been published rather suspect. It is very certain, however, that the condition of the navy to-day is very different from what it was in the late war, both as regards material and personnel. Between Italy's entrance into the war and the Armistice the only really conspicuous work done by the fleet was the dashing operations of small motor torpedo boats commanded by outstanding figures, which excited the admiration of the whole world.

It should be remembered that in those days it was the system which was essentially wrong rather than the men themselves. Poor pay and very slow promotion does not tend to foster dash on the part of an officer, and the captain of a destroyer or submarine who may be twelve or fifteen years older than his British opposite number, and has been struggling for years to raise a big family on very small pay, is naturally likely to look at the risks very carefully and to act cautiously, while politics seriously injured the morale of the lower deck.

The material of the navy was always excellent for Italy's special purposes, which until the Abyssinian Expedition were practically confined to the near seas. Their naval architects have long been among the most ingenious in the world and have been the pioneers of any number of ideas which have later been widely adopted.

AN ITALIAN CRUISER OF THE CONDOTTIERI CLASS—THE "RAIMONDO MONTECUCCOLI"

This vessel belongs to a class of very fast 6-in.-gun cruisers. They carry eight of the 6-in. guns, six 3·9-in. anti-aircraft, eight 37-mm., and eight 13-mm. anti-aircraft guns. She is also equipped for mine-laying

Fisher's famous first Dreadnought, for instance, was based on the ideas of Colonel Cuniberti, the Italian architect. Their ships have always been famous for their high speed on trial which has proved excellent publicity and has brought them many foreign orders. Shipbuilding is an industry which is greatly encouraged by the State, although latterly it would appear to have experienced great difficulty in obtaining the supply of materials, for many important ships have been an inordinate time under construction. The first two post-war battleships, for instance, which were laid down in October, 1934, are only now being delivered to the fleet, some eighteen months late in spite of their importance to Italy's naval plans.

These are the *Littorio* and *Vittorio Veneto*, 35,000 tons, 30 knots, mounting nine 15-in. guns, twelve 6-in., twelve 3·5-in. anti-aircraft and no less than forty small high-angle pieces. The Italians, it should be mentioned, usually carry bigger anti-aircraft batteries than any other navy in the world. The armour belt of these ships has a maximum thickness of 12 ins. and they carry three planes. They are to be followed by the similar *Impero* and *Roma*, but as these ships were only laid down in 1938, they will not be ready for some time yet.

The two new battleships are backed by four reconstructed ships, the *Conti di Cavour* and *Guilio Cesare* of 1911 and the *Duilio* and *Andrea Doria* of 1913, the reconstruction of the two latter being on the point of completion. They have been altered out of all recognition, for originally they steamed at 22 knots and mounted thirteen 12-in. guns, backed by eighteen 4·7-in. in the older ships and sixteen 6-in. in the newer, while they can now manage 27 knots and mount ten 12·6-in. guns, backed by twelve 4·7-in. in the older ships and twelve 5·3-in. in the newer. Each also carries forty-odd small anti-aircraft guns and their whole armament consists of entirely new types.

Whether the reconstruction of such old hulls and their acceleration by five knots is a good policy or not is a matter of debate, but Italy's demand for a powerful fleet of capital ships is significant as for years after the late war the service was enthusiastic for the *jeune ecole* and maintained that the battleship was dead in face of the attacks of submarines and aircraft. The change is partly due to the new imperial policy and partly due to a wise desire for steadier flow of promotion among the senior officers.

It is the cruiser fleet which is the real pride of the Italian Navy, and which is likely to prove the most

THE "NICOLOSO DA RECCO"

Ten years ago this vessel was said to be one of the fastest of small fighting craft. Her displacement is 1,628 tons (standard). The speed of the class is reported to be about 44 knots. Armament: Six 4·7-in. guns, four 37-mm., and six 13-mm. anti-aircraft guns

THE ITALIAN BATTLESHIP FLEET

Italy has two new battleships, the Littorio *and the* Vittorio Veneto, *both 35,000 tons, with nine 15-in. guns. There are also two other battleships, the* Impero *and the* Roma, *which will not be completed for some time*

useful section in the event of war, although the members of the submarine service contest this belief. When the 10,000-ton treaty type was introduced under the Washington Disarmament Treaty it appealed to the Italian imagination at once and seven were built. The first two had a speed of 35 knots and 3-in. side armour, while in the next four the speed was cut down to 32 knots and the thickness of the armour nearly doubled. All mounted eight 8-in. guns and twelve 3·9-in. anti-aircraft guns, while the first type each mounted eight torpedo tubes which were suppressed in the latter. Finally the last ship was given 36 knots at the sacrifice of practically all her protection. Then came the famous Condottieri series, very fast 6-in.-gun cruisers which were improved type by type. Twelve of these have been completed, and there are two more under construction. They started in 1930 with a displacement of 5,069 tons, a speed of 37 knots, and an armament of eight 6-in. guns with practically no protection at all, while the latest two laid down last year are to have a displacement of 8,000 tons, a speed of 35 knots, ten 6-in. guns and very fair armour.

In addition, twelve very fast light cruisers, designed to be the fastest in the world, were laid down in 1939, and are due to be completed next year, although that is not altogether likely.

There is a big destroyer fleet, all of which are fitted for mine-laying, twenty-eight under ten years old with displacements varying from 1,220 to 1,730 tons, a speed of 38 or 39 knots, and a standard armament of four 4·7-in. guns and six torpedo tubes. There are also thirty-one of post-war construction but over ten years old. Two more ships built during the war complete the destroyer fleet.

In addition, making a particular appeal to Italian feeling on account of their exploits during the late war, there are seventy-odd motor torpedo boats, including fifty modern 47-knotters with which the people have been told that Italy could make Malta untenable, but the balance are not of much military value.

The Italian submarine fleet is the biggest in the world. It consists of forty-six ships of the ocean-going type, which in Italy includes everything over 850 tons displacement on the surface, and seventy-three coastal boats. Many of these are fitted for the laying of mines but the fleet, although numerous, has none of the magnificent homogeneity of the French submarine fleet, and its design is so varied that it might well be called a fleet of samples.

The navy list is completed by a host of small craft, auxiliaries, etc., of every type which absorb a large personnel. The absence of aircraft-carriers is significant, but a very large number of small planes with catapults are carried on board the various fighting ships. For the bigger planes Italy prefers her shore aerodromes.

UNDER THE SHADOW OF VESUVIUS LIE THESE ITALIAN DESTROYERS The destroyer section of the Italian fleet is very numerous. All of them are fitted for minelaying

ITALY'S SUBMARINE FLEET BULKS LARGELY The Italian policy has been to have big submarine and fast surface fleets. There are seventy-three coastal submarines and forty-six of the ocean-going variety

On left—**A BOW VIEW OF THE "GORIZIA," A SISTER SHIP TO THE "ZARA":** She had been damaged when this picture was taken and was being towed into Gibraltar for immediate repair after an explosion

WITH A MASS OF TOP HAMPER—THE HEAVY CRUISER "ZARA" IN COMPANY WITH THE "TRIESTE" The *Zara* has a displacement of 10,000 tons and presents a clustered silhouette perhaps not very desirable. She carries a load of guns of varying calibre. There are eight 8-in. guns; together with twelve 3·9-in., ten 37-mm., eight 13-mm., all for anti-aircraft protection

HOW THE GERMANS FIGHT: Glimpses of Enemy Methods and Men

A MECHANISED ARTILLERY COLUMN MAKES A DETOUR: A Belgian road and bridge have been blown up in order to hamper the enemy advance. The crater is evident in the foreground, and the bridge support on the right is cracked. The column, therefore, makes a detour. This cross-country movement has in many cases only been made possible by the recent dry weather

THE GERMAN INFANTRYMAN CARRIES A LOAD OF EQUIPMENT: The German love of military equipment, in all its forms, tends to load the infantryman with numerous gadgets. In the campaign in France he has been placed far behind the mechanised forces

THE MUCH-IN-EVIDENCE MOTOR CYCLIST CORPS: The advance into N.W. France, carried out, as far as weight is concerned, by the heavy German tanks, was infiltrated by the armed motor cyclist corps who rushed forward on any available road and "captured" towns not held by Allied forces. Motor combinations appeared in large numbers. Both types are seen in this picture which comes from Luxembourg

HOW THE GERMANS USE RUBBER BOATS: Not only have the Germans ferried troops across Dutch waterways in rubber boats, but they have also used them to form pontoon bridges. In this picture, taken on the bank of a Luxembourg stream, such a rubber pontoon bridge is seen on the right. It can support a motor car as well as the horse-drawn transport which the Germans still use in conjunction with mechanised units. Some of the rubber boats may be seen lined up in reserve on the further bank

TALKING IN THE AIR

With Air Signals of the R.A.F.; Wireless, Lamps, Pigeons, and the Rest

Described by

NOEL THOMPSON

I REMEMBER very clearly the thrill I got when, just after the last war, I was fiddling with a ramshackle wireless set and struck the wave length on which pilots arriving at Croydon spoke to the aerodrome. It was early in the morning, and the unknown voice said, "Hullo, Croydon, I shall be down in ten minutes. Tell them to have bacon and eggs and coffee ready for me, because it's damned cold up here." Thereafter for weeks I used to eavesdrop around that wave length, picking up titbits of flying conversation.

It is a far cry from those days to the present, when the R.A.F. is using daily between 600 and 700 different frequencies! In fact, of course, the Signals Section is one of the most important parts of any R.A.F. Command. It has to provide a continuous service that will not break down under any emergency, and ensure that every message arrives, whether by telephone, teleprinter, dispatch rider, wireless, or pigeons. The officers are all regulars with flying experience, and each method of transmission had its own separate organisation.

Take the land organisation first, the links between the Air Ministry, the Bomber, Fighter, and Coastal Commands, radiating from them to the aerodromes and to the report stations of the Observer Corps and listening posts. The network of lines started before the war and finished since is so skilfully pieced together that communication can never be interrupted at a point of importance. There can be a constant interchange of circuits and some of the lines are what is officially known as "untappable." In other words, should a parachutist, Fifth Columnist, or spy "plug in," he would hear nothing but a confused humming. And to show how busy the telegraph lines are—and they form a complete system separate from the complete telephone system—they deal with some 500,000 messages a week.

In addition there are the teleprinters for the rapid transmission of messages and reports, and in this section of signals there is still room for operators. Women are doing grand work for the R.A.F. both as operators of teleprinter and telephone, and 1,200 of them from the W.A.A.F. have already been

(*Continued on next page*)

THE WIRELESS SET IS QUITE A FORMIDABLE INSTALLATION in a Coastal Command flying boat. But it has to be used with caution, as Mr. Thompson here sets forth. In this picture the captain is receiving a message in code

SOMETIMES A COASTAL COMMAND FLYING BOAT HAS TO SPEAK TO A DESTROYER: It has seen a bubble or oil trace, or a trawler in urgent need of assistance. A Morse message flashes down to the destroyer, which immediately goes off to the area defined by the observer in the seaplane

AIR SIGNALLERS HAVE MANY METHODS of communicating with one another in the air and on the land. One of them, which is very useful for land communications with an approaching pilot, is the Aldis signalling lamp which works very much in the manner of a heliograph

THE WIRELESS OPERATOR-OBSERVER HANDS A MESSAGE TO THE PILOT during one of the longest flights yet undertaken by the R.A.F. when a Vickers Wellington made a flight to Narvik and back, a distance of over 2,000 miles and mostly out of sight of land. Positional messages would become a matter of necessity on such a tremendous flight

PLANE SIGNALS TO PLANE WHEN IN MID FLIGHT: In the case of fighters it is usually by wireless telephony, pilots being heavily occupied as it is without having to bother with written chits. On large bombers it is different; there is a specialist among the crew who can superintend the matter of signals

TALKIN AIR and Other Methods of Air Signalling

With a Special Note on the Marvellously Trained Pigeon Messengers

The fighters, as anyone who has seen and heard the displays at air pageants will have realised, use only wireless telephony when speaking to each other or to those on the ground. Naturally the pilots are too much occupied to do anything else than to speak into the mouthpieces and hear the replies through the earphones under their helmets.

IN A RECONNAISSANCE OR FIGHTER PLANE, there is a much smaller wireless installation than is shown on the big flying boat. Everything has to be compact and no bigger than absolutely necessary. Here, the wireless of an F.A.A. machine is being inspected

trained for this work. In fact, it might be that to one of these women would fall the task of setting in motion the whole of our air defence system!

Then there are the dispatch riders on duty day and night at every R.A.F. station, kept busy delivering messages which can only be sent by hand. As for the invaluable pigeons, I shall deal with them later,

THE TELEPHONIST BELOW GROUND is receiving, over land wires, instructions from headquarters with reference to further operations the next day. This scene is part of the land control of the R.A.F. in France

but in cases, as so often happens, where it is unwise to use wireless, the birds are a reliable, if slower, substitute, and have proved extremely valuable, especially to the Coastal Command.

Signals, unlike in the Army, are responsible also for the coding and decoding of messages, and must work fast. But even codes are not considered safe. As one senior officer put it, "our basic assumption is that every time we press a key the enemy can hear." An intelligent enemy intercepting a message in code can make quite a lot out of it, sufficient, for instance, to deduce when a certain operation is about to take place, and so wireless is used as sparingly as possible.

Every R.A.F. machine carries wireless, naturally, for communication either with each other, or with the land or ships. In the case of a long-distance flight of bombers the wireless operator is in touch constantly with home, though often he is forced to keep silent for fear of giving away his position. In the same way the intercommunication is used sparingly until the objective is reached, when the flight leader may give his instructions, as for instance if he wants his bombs to straddle the target and the whole flight to release their first bombs simultaneously there is no danger in the enemy hearing his final commands "dropping, dropping, go," since the result will reach them soon enough. As for the Coastal Command, and aeroplanes operating from ships at sea, when there is no risk in revealing their position they will, through their wireless operator (the rear gunner or observer may be duplicating this job), be in constant touch with the land or ship, making reports and receiving instructions.

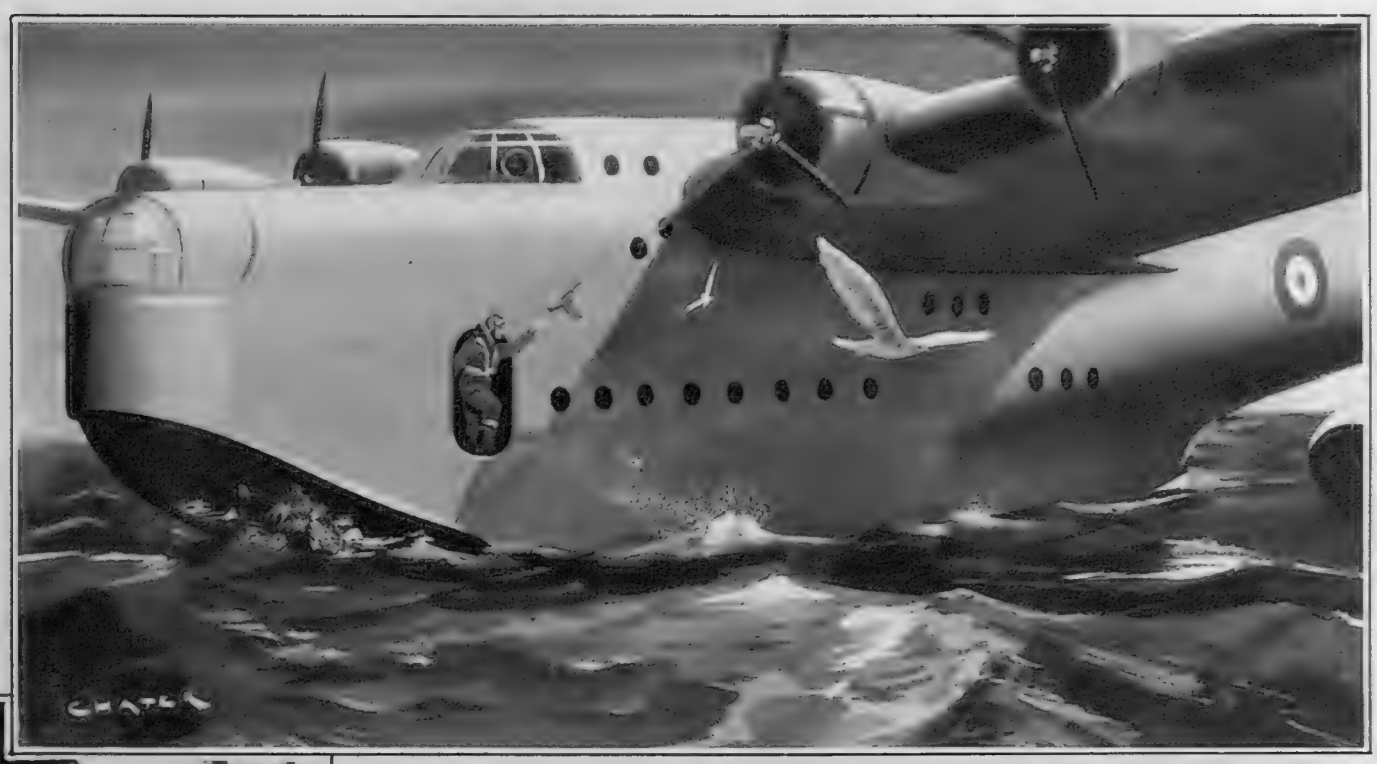
On the other hand, aeroplanes working from an aircraft-carrier, or a ship far out at sea will only use wireless when very near the ship for fear of the message giving away the position. The exception is when an enemy submarine is spotted, or enemy ships are observed. To this must be added, naturally, during an engagement when spotting the fall of shot.

ANOTHER R.A.F. CONTROL ROOM UNDERGROUND: Here, in a wireless receiving station in France, the control is keeping in touch with R.A.F. patrols actually in the air. Instructions from headquarters are received over land lines, which are arranged in such a manner as to be practically untappable, and the messages are then transmitted from this station to the receiving apparatus in the fast-moving plane—contact thus being maintained throughout the operations

G IN THE

(This article by Noel Thompson is continued from page 281)

This has necessarily been rather a brief and sketchy description, since both the wireless and visual side of the R.A.F. signalling are among our most closely guarded secrets. But there is no secrecy about the pigeons. There are more than 2,000 of these birds now at work, lent by fanciers, headed by the King. Recently one pigeon released from an aeroplane down in the sea made a 200-mile flight home at top speed which resulted in the rescue of the crew.



RELEASING ONE OF THE THOUSANDS OF PIGEON MEMBERS OF AIR SIGNALS: They are professionals in the bird world and know how to bale out of an aeroplane in the proper manner. These birds are being liberated from a flying boat which has alighted because of engine trouble. It is inadvisable to use wireless at this moment, therefore the birds are released and, travelling at 40 m.p.h., will soon be back in their lofts

TALKING IN THE AIR radio telephony is frequently used, and here the operator is seen in the act of receiving a call from the land. The mouthpiece is arranged somewhat like a respirator

Most aircraft of the Coastal Command and most bombers carry pigeons—and the fact that they are undisturbed is proved by one which laid an egg recently at 20,000 ft. They take a considerable amount of training. For instance, experienced birds, when put off the hatch will keep their wings closed and do a dead drop until they are clear of the slipstream from the air-screws. Then, after one or two circles, they make straight for home. The novice bird tries to fly at once, is caught in the slipstream, and blown about ruffled and bewildered, taking longer to set its course. Once pigeons reach their home loft, the owner telephones the C.O. at the nearest aerodrome immediately. Novices can be taught by being thrown out wrapped in newspapers, but this is rarely necessary. These figures are interesting. Average pigeon flights so far timed have been about 40 m.p.h., with a range of between 300 and 400 miles, and the loss of pigeons has been less than three and a half per cent.

R.A.F. Signals are inclined to think that theirs is a dull life. But occasionally they get excitement. A few weeks ago one officer was talking to a squadron which was taking off on a flight. Suddenly he heard a voice say quite calmly, "I am about to hit the fence." The signals officer queried, "Did you say you were about to hit the fence?" To which came back the answer, "I did, and I have now hit the fence." The pilot's engine had cut out, but he had coolly managed to put his plane down though outside the aerodrome. Unhurt he climbed out, rushed back to the aerodrome, took another machine, and caught up with his squadron.

A BASKETFUL OF PIGEONS being taken on board by a member of the crew of a Coastal Command flying boat

SAFELY OUT OF THE SLIPSTREAM: These trained pigeons of the R.A.F. have learnt how to avoid being tossed and ruffled by the slipstream of an aeroplane. They tuck in their wings and drop dead for several feet. They then open up, as this bird is doing, make two or three circles and are then off for home; the inexpert are sometimes wrapped in newspaper before being released

THE VOICE OF THE HIGH COMMAND IS HEARD ON THE AIR: A high officer of the Headquarters Staff (Air Vice-Marshal R. G. Parry a Naval D.S.O. of the last war) is seen conveying a message to a distant pilot in command of one of Britain's huge flying boats from the wireless room of the Coastal Command on land

THERE are OTHER THINGS than WAR

A Commentary on the Psalms; The Human Touch in the Empire; Londoners' Harvest

THE Psalms in Human Life.—I am not, I am sure, the only one who, in these dark days of loveliest summer, has been struck afresh by the aptness and comfort of the Psalms in our anxieties and sadness. It is natural enough. It is the poetry of a race engaged in a long struggle for existence against ruthless enemies, of a people fighting against odds for freedom and for the right of their children to live under conditions better than slavery, fighting for all that makes life dear, for the sweets of civilisation, the blessings of peace, the comforts of religion. So it is that the Psalms, set aside for almost every day, seem to us to have been specially written to answer the prayers and to assuage the anxieties of that very day, and their essential wisdom, their aptness to the hour, their "modernness" and their consolation, impress us with tremendous force, and bring us powerful aid.

Lord Ernle (Rowland Prothero) wrote many years ago a scholarly and historically complete commentary on the Psalms in this aspect of their usefulness. He called it by the name I have chosen as my caption and it has been in its way a best-seller. He showed how for centuries the psalms have been held up by the frail hands of struggling mankind as the mirror of the human soul; how close and vital is their association with national and individual life, how timeless their appeal, how vast their influence on literature and art, how tremendous their power over human life through the ages.

He carries us through the struggles and miseries of the Dark and Middle Ages, of the Reformation, the wars between England and Spain, the Huguenot trials from 1524 to 1762, the Puritans, the Covenanters, onwards until the romance of religion changed its character to what we call in history "modern times" down to the South African War and the end of last century. Whatever Prothero wrote was full of charm and human interest, like the man himself, whom I am thankful to have known and talked to, though that happiness came to me only at the very end of his long life, in the mellowed charm of his old age and physical frailty. But his books remain and his *Psalms in Human Life* is still to be bought, and is still powerful in comfort and an inducement to faith and serenity.

In quietness and confidence shall be your strength. On the day on which I am writing this short article, I know beyond all doubt that I have only to turn to the appropriate psalms to find words which will exactly echo the feeling of the hour common to us all and will admirably afford the comfort for which the soul yearns and the common sense for which reason gropes. Yes, there it is, divinely punctual, superbly apt, to whatever psalm you turn.

Men from the Empire.—He was a corporal in the artillery. He was toiling up a hill road in the dust and heat, and his battle dress seemed to me cruelly thick and inappropriate for a perfect summer day. I stopped and took him into my car, for he was walking to visit a friend he had made a mile along my road.

He told me he was born in Saskatchewan and had lived in Vancouver. He had fought in Russia in the last war and showed me his papers and his medal ribbons, which (for reasons I could not comprehend) he refused to wear, preferring to carry them in his pocket. (Was it some form of reaction from an outworn snobbery, to be found perhaps in the new Democratic Armies of the Empire, which induced him to conceal proofs of experience in war and good service? If so, I could not, at my age, understand it.)

He was now quartered in a military camp many miles from where I live and he admitted that it was lonely and dull at times, and he thanked Heaven for the one friend he had made. We talked of Canada and his face lit up—a sad, grey, lined, intelligent face—when I told him I had lived in Canada in old days and recalled several towns well known to him and faintly remembered by me. It seemed to him far more extraordinary to meet in an English lane an Englishman who knew Vancouver and had "stopped off" in Regina than it seemed to me to meet a soldier from Western Canada walking in an English lane.

There is significance in that ingenuous statement. It points a rigid finger in the direction of an urgent duty to all of us older folk who "do what we can" in our homes. It may be small beer to offer to such men from Canada and Australia the simple delights of tea on an English lawn or a game with small English children, but it means more than one might suppose to men torn from their own homes and jobs and dumped down in a country, in many ways foreign to them, in a milieu of dull routine and dusty ugliness which characterise camp life everywhere. The eyes of such men light up when one pulls out old photographs of Canada and talks to them of their own land and, small beer as it may be, they are cheered by a draught of family life and a sight of children playing on green lawns.

"The Queen's smile did it."—Before he left he made a remark which stuck firmly in my memory. He spoke of Canada's reaction to the events of September, 1939. Canada, he said, was right in it from the start, there never was any doubt that she would back the Old Country up, 100 per cent. and from the start, to see the business through. And then, ruminating, he added: "Ye know, it was the Queen's smile that did it." It was an arresting remark. He enlarged on it. He spoke of the visit of the King and Queen; he remarked on its providential aptness, and he ended again with that remark about the charm and sympathy of the Queen's smile.

I thought: The Queen would have been proud and glad to hear those words. Time passes, and memories fade. In the fearful march of desperate events, the very fruits of quite recent achievements seem to wither, and one asks oneself: "What profit was there in this or that? Who shall draw out and revalue the gains and benefits derived from sound and constructive matters thrown untimely into the limbo of forgotten things?" Yet time and again there will come back to us, if we search, clear proof of the eternal values that lie in human contacts, of the strength of sympathy, the immeasurable power of charm, grace, tact and understanding, radiated by high and humble folk alike.

[I take a single example: twenty-five years ago King George V visited Nepal. His simple kindliness and his human interest in all he saw made a great impression. Not only is that visit freshly remembered and constantly referred to in Nepal but it had an effect—a real effect—on the present war effort from that territory.] "It was the Queen's smile that did it." Eight monosyllables of tremendous significance in which the Queen may take pride.

"Urbs in Rure."—Many young Londoners, evacuated last September to rural districts, went home essentially unchanged, except physically. Their hearts were Cockney still and they had learned little of country love and a good deal about the inconveniences and lack of distractions in village life. There were exceptions, of course; and among those who stayed through the winter and spring and are still with us, there are some heartening examples of time profitably spent.

One small London boy in particular, who came to see our garden, astonished me by his acquirements of knowledge concerning plants and shrubs. He had learned the Latin names and scientific species of most of the commoner flowers and flowering shrubs, and had a very good idea of the divisions and sub-divisions of the horticultural family trees. Here was a boy whose intellectual curiosity had awakened in new surroundings, who had made the best use of his time, and had gained for himself a lifelong interest and hobby. His case was the more interesting to me because he remained a confirmed Londoner.

He had not fallen in love with country life. He was as resolved as ever to make his life in the crowded streets of a city. He was pursuing a hobby and not a profession, he was learning every day for the sheer love of knowledge, and he was making a grand harvest. One day he will go back to London and to work. I think that all his life he will be thankful for the year (or more) which he spent in the country, for the opportunity given him and for the good use he made of it.

J. G.

THE REVIVAL OF AN ANCIENT TRADE: Basketmakers are now hard at work producing fruit and agricultural baskets for the coming harvest. In recent years the industry has declined, due to the importation of baskets from Holland, but now basketmakers in the Severn Valley are hard put to it to meet the demand

THE HORSE DISPLACES THE TRACTOR: Petrol restrictions are causing farmers to revert once more to the more picturesque, although slower, horse-drawn plough, and once again the ploughman is seen walking in his furrow instead of riding in front of it. This rural scene is at Loweswater, Cumberland, with Carling Knot in the background

IN THE HEART OF THE METROPOLIS: The colourful display of tulips which are now in full bloom in St. James's Park. Planted in different-coloured batches, they present a rainbow-like effect set in a background of green trees

THE HEROISM OF THE R.A.F.

Whose Bravery Has Aroused the Admiration of the Whole World

THE KING WITH THE FLYING MEN IN EAST ANGLIA: His Majesty being greeted by Air Vice-Marshal J. E. A. Baldwin, on his arrival at a R.A.F. Bomber Command Station in East Anglia. The King here decorated five officers, two sergeant-observers and an aircraftman-air gunner for gallantry in action against the enemy. Later the King chatted with some of the young pilots who have so heroically maintained the very highest standards of the R.A.F. during the present struggle

FOR HEROISM AT STAVANGER: Air Vice-Marshal Baldwin, commanding one of our bomber groups, decorating Flight-Sergeant Gordon Allen Powell with the Distinguished Flying Medal for an act of outstanding gallantry and devotion to duty. Flight-Sergeant Powell was captain of an aircraft which attacked Stavanger Aerodrome in the face of intense anti-aircraft fire. He was wounded in the shoulder and left side. Despite his wounds and loss of blood, and the severe damage to his aircraft, he reached his home base—a distance of 370 miles—in extremely bad weather and at night

HOME AFTER SIX MONTHS OF INTERNMENT: These British airmen have just arrived home after spending six months in a Belgian internment camp. They were flying over Germany last October in reconnaissance aircraft; the severe weather of that time caused ice to form on the wings forcing them down over Belgium where they were interned. When Belgium was invaded they were, of course, released, and by begging lifts and walking many miles they managed eventually to effect contact with the R.A.F. in France

OUR COLONIAL PILOTS ARE DOING SPLENDID WORK ON THE WESTERN FRONT: HERE IS A CHEERFUL PARTY OF THEM WHO HAVE BOMBED AND MACHINE-GUNNED THE ENEMY WITHOUT RESPITE EVER SINCE THE NAZI INVASION OF FRANCE

R.A.F. AWARDS ON THE FIELD: Sergeant-Pilot A. N. Spear and Sergeant-Observer R. V. T. Kitto, two members of bomber-crews who performed great feats in low air attacks on the enemy. They have both been awarded the Distinguished Flying Medal

THESE PILOTS, AIR GUNNERS AND OBSERVERS IN FRANCE HAVE PERFORMED AN AMAZING JOB OF WORK BOMBING THE COMMUNICATIONS OF THE ENEMY: THIS "FLIGHT" HAVE BEEN IN FRANCE SINCE THE DECLARATION OF WAR

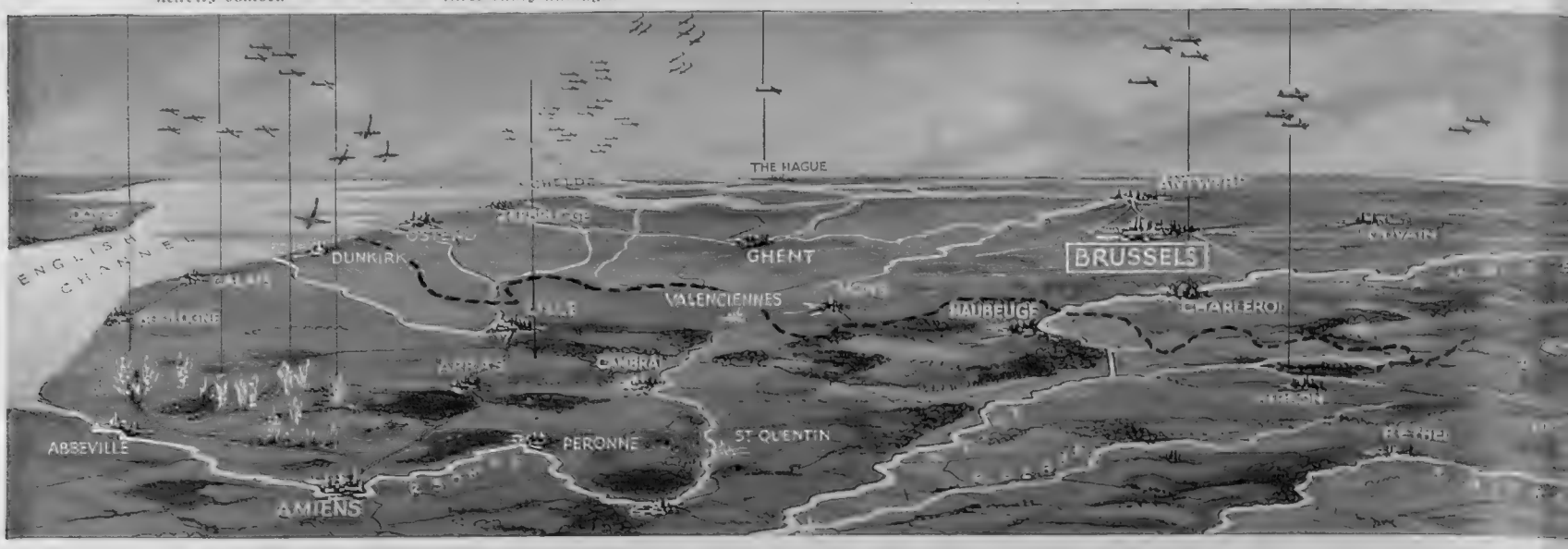
Tanks, armoured vehicles and troop concentrations, forming vanguard of enemy advance to Channel ports, heavily bombed

Eight Hurricanes attacked thirty-five Junkers 87 dive bombers in the Arras region. Six bombers definitely destroyed; three badly damaged

One R.A.F. machine bombed the main runway of The Hague Aerodrome

The railway station at Charleroi was damaged by R.A.F. bombs

A strong force of Whitley bombers attacked railways and cross-roads near Hirson



A Typical Narrative of a Day Behind the Lines with the R.A.F. shown pictorially

THE battle front during the past week, May 19 to 25, has been one of great perplexity. The rush through of the German armoured forces at Sedan and the advance to St. Quentin and Laon, which had been achieved by the 18th, had produced much confusion among the Allied forces, who had not been prepared for so terrific an onslaught of gigantic tanks. Something of a general mêlée ensued, with various engagements with the enemy at different places as the Germans pushed on. Pushing on in their now recognised and understood method, with advanced motor cyclists, followed by tanks and troops in lorries, and their way prepared for them by bomber escorts, the Germans never paused, but advanced every day. Any immediate idea of a push to Paris was gradually realised to be outside the German programme—the Channel ports was the objective, and a thrust to separate the Allied armies.

By Tuesday the 21st the Germans had reached Amiens and Arras and on Thursday Mr. Churchill announced "Abbeville is in enemy hands and heavy fighting is proceeding in and around Boulogne." A gap existed between Bapaume and the River Somme, through which the enemy poured a ceaseless stream of motorised troops of various types, not pausing to stop and occupy in force, always pressing on for the goal of the Channel ports. On Friday the 24th the Germans were stated to be in Boulogne which had been evacuated by the British troops.

Supply trains on the Aachen-Krefeld line successfully bombed four times by a Hampden

Marshalling yard near Aachen hit thirty-five times

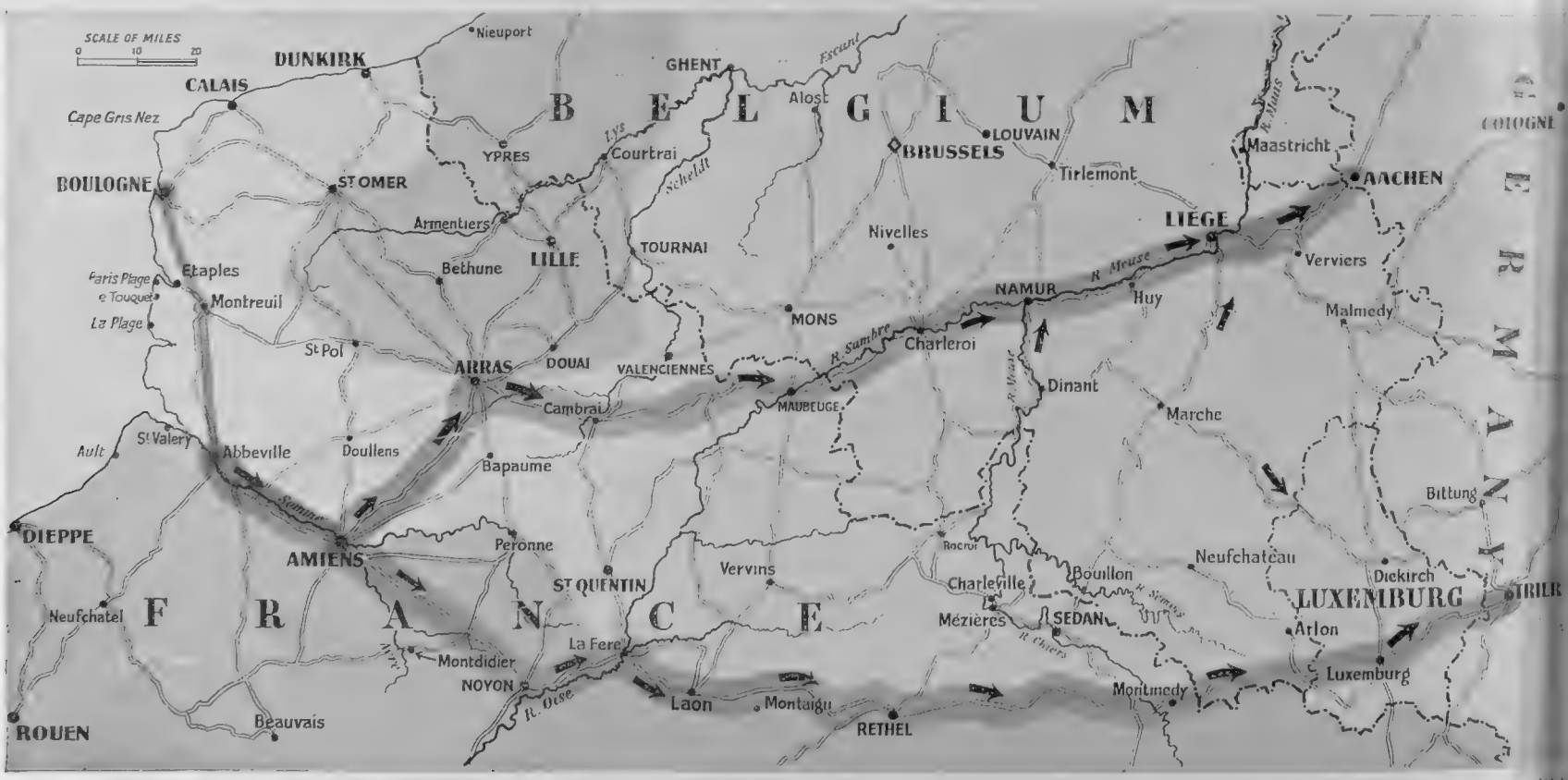
Two long waggons—part of a supply train—blown up by a Hampden bomber

At Euskirchen petrol fires started by bombs dropped on marshalling yards. Fires were seen to be burning 45 minutes later

Near Bonn, a salvo of bombs from a Wellington aircraft resulted in a blinding blue flash

A Typical Night-time Bombing Record—A Busy Evening for the R.A.F.

It had been a week of grave anxiet and uncertainty. Mr. Winston Churchill, when making his first broadcast as Prime Minister on Sunday the 19th had emphasised the extraordinarily successful advance of the enemy —"strong columns of their armoured



TWO CHIEF SUPPLY ROUTES FOR THE GERMAN FORCES IN NORTH-WEST FRANCE

The German command in the advanced area of Amiens—Arras—Abbeville has had to look to supplies coming from Aachen and Trier. The two main roads to these bases are indicated by a grey tone. Portions of these routes have been open, but it would appear that at certain districts, devious routes might have to be taken before lorries could come along the broad main routes. The approximate areas held by the Allies are indicated by a light tone. The sway of battle prevents any more definite indication

The WAR in the AIR and on LAND

Three Wellington heavy bombers made direct hits on Namur – Gembloux main road

An important roadbridge and railway crossing at Givet damaged

A Hampden bomber attacked two supply trains standing on main line 10 miles east of Liége

The French armies had been reorganised and were lying entrenched on the south bank of the Somme, over which all bridges had been destroyed. The Somme itself is a natural obstacle to the heavy tank, having a great stretch of marshy land on its northern bank. The French position generally, by Friday the 24th had formed itself along the Somme, Oise, Aisne and Meuse to the Maginot Line. But there was no stabilised line as in the Great War, every district adjoining the German advance being liable to some change. For instance, on Tuesday the 21st Arras and Amiens were said to be occupied by forward units of the enemy. The next day Arras was back in French hands and on Saturday, the 25th, a large part of Amiens was regained by the French.

THE VICISSITUDES OF BOULOGNE, THE ONCE SO FAMILIAR AND WELL-LIKED FRENCH PORT

Boulogne was last week in and out of enemy control, according to the varying statements in the Press from day to day. Here is the giant statue of Britannia overlooking the harbour. It was unveiled two years ago

One R.A.F. aircraft penetrated as far east as Leipzig and bombed an important power station near Rotha

The British forces in Western Belgium had been holding the line with great pertinacity and with a growing knowledge of the new technique necessary for combating the German tactics when on Tuesday morning it was made known through Paris that the King of the Belgians had decided to withdraw his army from the conflict. This was in direct opposition to the statement of his ministers assembled in Paris the previous night. In spite of this astounding move on the part of King Leopold, the report, given out by the enemy, that the Allied troops in this northern area were surrounded and cut off, was quite without foundation. The Allied troops were fighting on with unimpaired courage, and were holding their positions against very heavy assaults.

Throughout the week the R.A.F. had done magnificent work in general support of the troops during the daytime and constant night bombing raids which must have seriously hampered the general scheme of the German High Command. Fantastic odds were taken on by our Fighter Squadrons, none of whom seemed in the least dismayed by the tiers of German bombers which have appeared over the Western Front. The Messerschmitt protectors of the German bombing squadrons had to look after their own skins and in many cases their protective screen was entirely destroyed and the bombers themselves successfully attacked. The British losses were very small compared with the destruction wrought on the German fighters and bombers.

vehicles are ravaging the open country—they penetrated deeply and spread alarm and confusion in their track—it would be foolish to disguise the gravity of the hour." M. Reynaud also made a dramatic statement on the following Tuesday the 21st when he admitted that incredible mistakes had been made by the French Army on the Meuse where bridges had not been blown up.

Official news of the actual fighting and the position of the Allied armies came very meagrely, and it was only as the week drew to an end that it was possible to obtain any faint idea of the conditions at the battle front. It was obvious from the German war reports that they were well aware that they had not defeated the French and British armies, who remained intact. The Allies ranged along a line through close to Ghent in Belgium, by Valenciennes on the Franco-Belgian frontier, to Cambrai and Arras, forming the northern part of the much-discussed gap through which the German armies had been pushed to the famous Channel port at Boulogne.

A GERMAN INVASION WEAPON WHICH FOLLOWS UP THE PARACHUTIST TROOPS —THE TROOP-CARRYING PLANE

It should be borne in mind that Rotterdam experience showed that after the parachutist troops had been dropped and more or less secured a base, at Waalhavn Aerodrome, big troop-carrying planes arrived, which gave greater power at once to the German nucleus. Here the artist envisages three Junkers S.W.52 type troop-carrying planes, setting out to form a nucleus (if not interfered with), supported by five Messerschmitt Me 110's as a fighter escort

DERELICT CARS BARRICADE A ROAD: Old motor cars are being used by soldiers guarding the main arterial roads to form a barrier which could immediately be thrown across the roadway if necessary. Precautions against Fifth Column activities have been intensified throughout the country during the past week

AN ENGLISH COUNTRY LANE IN WAR-TIME: Bordered by trees still bearing blossom, but the old hay-cart and waggon are for a different purpose. They form a bottle-neck so that the single line of traffic can be scrutinised

IMMOBILISE YOUR CAR AT NIGHT

How to Prevent Motor Vehicles from Being Driven Away by Unauthorised Persons and Thus Comply with a Vitally Important Request by the Authorities

By A. PERCY BRADLEY, M.I.A.E., A.M.I.Mech.E.
(Clerk of the Course, Brooklands)

AS I write these notes, which owing to the conditions of war is a considerable time before they actually appear in print, the subject uppermost in everybody's minds is the dropping of troops by parachute. Those of us who own motor cars have been advised when we leave our cars unattended to put them out of action so that a stranger cannot use them for an ulterior purpose. Quite rightly the suggestion is that the rotor in the high tension distributor should be removed. Motorists with a mechanical knowledge would have no difficulty whatever in finding and extracting this important part but the owner who does little else but fill his car with petrol, oil and water will quite possibly be a little nervous in carrying out these instructions. His first difficulty will be in locating the high tension distributor. Let me guide him.

Lift up the bonnet and even a casual inspection will reveal the exact whereabouts of this distributor. The wires from the sparking plugs are directly attached to it and it usually takes the shape of a circular brown-coloured bakelite cover. It is held in position on every car I know by means of two flat steel springs. These can easily be slackened off, and the brown cover, along with the high tension wires, can be lifted off. There is then exposed to view an arm or a circular disc usually of the same material, and if the engine is rotated by hand it will be seen that this arm or disc goes round in a circle.

I realise that most owners who are not too clever in mechanical matters may be a little nervous in removing this part because when they first became a motorist they were warned that it was highly undesirable to monkey about with the ignition timing as only an expert could replace it in proper order. However, the amateur need have no fears in removing this rotor because when he wishes to replace it he will find that it will only go back into one position. Having removed the rotor I suggest that the distributor cover should be replaced because by so doing the unauthorised person who wishes to make illegal use of the car will be put off the scent. It is highly improbable that he would be in possession of a spare, but hiding up the deficiency will undoubtedly delay his operations.

The owner must be careful, first of all, not to lose the rotor and secondly, not to drop it or handle it roughly because it is composed of a more or less brittle substance which will crack quite easily and render the car immobile. I would strongly urge every motorist to carry out this very simple operation whenever he leaves his car unattended. Unless it is always done it is not worth while doing it at all because if the parachutist arrives he will probably come when the weather looks unpleasant or perhaps when it is dark.

Do not forget, too, that much of the success that can be credited to parachute troops is due to their ability to take possession of a nearby car and either get to their predetermined destination or get into touch with a Fifth Column person in this country with the minimum of delay. True, many carry bicycles on them during their descent but this will not deter them from getting hold of a car if one is available.

The Government have formed the local defence volunteers and already the numbers enrolled are probably sufficient for the purpose but I have not seen it stated anywhere that a volunteer with a car is preferred to one who is not a motorist. The authorities must know from the records available how many car owners there are in each district but the form which volunteers were asked to fill up made no reference whatever to car ownership. This seems to me a pity because a man who will be useful with a rifle or a machine-gun to foil the success of an enemy parachutist would be twice as useful if he had a car beside him. A motor cycle would conceivably be an even more efficient type of transport for the job.

The whole matter is definitely very serious and I, therefore, urge the authorities not to lose sight of the fact that a man with a car is definitely more efficient on this particular job than a man who has only his feet to transport him from place to place.

In the light of what we now know, it is a most regrettable fact that the past Governments of this country did not encourage the entire population to become motor-minded or, better still, to own a motor car or motor bicycle. Much leeway has been made up so as to convert a goodly number of those called up for service into efficient car drivers, but had the authorities during the years of peace placed less restrictions on the ownership of vehicles we should to-day have a far larger number of young men who, at this stage, would not require to be taught how to steer and change gear. One begins to realise why the enemy not only encouraged their nationals to drive in motoring competitions and trials but went out of their way to induce the man in the street to watch motor racing whenever such events were held.

When one drives a big car the average main road gradient is of little consequence, but when the driver sits behind the wheel of a baby vehicle even a slight rise may call for a change of gear. When driving in country which is more or less strange to me, I find myself making a hasty judgment as to whether the gradient in front will allow me to surmount it on top gear. Frequently, I find my judgment is at fault, for what looks like quite a steep rise has little or no effect at all on the engine revs. I think this is a common experience amongst motorists in general, and I have never yet been given a satisfactory explanation as to why what looks like a formidable gradient sometimes turns out to be nothing alarming.

On a journey which I do practically every day of the week I find there is a portion of the Guildford by-pass which is most deceiving in this respect. Going in the direction of Portsmouth it is the last rise before entering the village of Milford. It looks quite steep, in fact, if I did not know how my car romps up it I should say the gradient is more severe than on any part of the hill up to the top of Hindhead. I suppose the only true explanation is that the banks on each side of the cutting through which the road runs give rise to an optical illusion.

Driving a small car teaches one a number of things, and in talking of gradients it brings home to me the fact that a driver of a baby car does not necessarily go up a hill in the shortest space of time by keeping his foot flat down on the accelerator pedal. To test this assertion the driver should ease off the pressure on the pedal and after a certain amount of experience he will find that there is just one position where the engine appears to get its teeth into the job. To go beyond this point merely means that the engine will give off diminished power and burn up a wasteful amount of petrol.

Some people have got it into their heads that because of the war, automobile design will stand still until peace returns. However, it must be remembered that nearly all countries which were manufacturing cars before September last year are still doing so and exporting to foreign countries. Obviously, where competition is met in the sales of cars, design cannot become stagnant. In addition, the use of cars for military purposes is bound to affect design, and so when peace returns I think we may take it for granted that great improvements in the mechanical side of cars, as well as in appearance, will have taken place.

In the last war our motor industry almost ceased to exist except for manufacturing the comparatively few vehicles required for the military, with the result that when peace came the designs of our competitors, particularly the Americans, were far in advance of our own. Our motor industry found great difficulty when war ceased to regain a footing in the overseas markets. Our present leaders of the industry must remember those difficult times and as everything is being done to maintain and even increase our exports it is most unlikely that the makers have got rid of their designing staff. It is too early yet even to guess in what direction improvements will take place but war-time is usually a suitable period for the unorthodox to make headway.

Some years ago I recorded in these notes that the London General Omnibus Company had introduced on the streets a new design of bus which did not easily disclose by its appearance whether it was coming at you or going away. The radiator was hidden in such a way that the front of the bus was very similar to that of the back. I have noticed recently that the London Passenger Transport Board now have on the roads a bus which appears to have a definite radiator at the back. Motorists who drive in London and the Home Counties should be on their guard when such vehicles are encountered because the confusion they are apt to create might place a motorist in an awkward position. This is most likely to occur on a narrow road because on a wide one the bus being on the left-hand side would indicate whether the vehicle was going ahead or approaching.

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THE SPHERE REGISTER OF HOTELS

The majority of these hotels are personally known to our Hotel Correspondent, Mr. Ashley Courtenay, who will be pleased to give further details regarding them to readers who write to him, c/o "The Sphere."

ENGLAND

Aldeburgh.—Wentworth Hotel. Tel. 312 & 313.
Bath.—Lansdown Grove Hotel. Tel. 3235/36.
Bexhill-on-Sea.—Hotel Riposo. Tel. 472.
Bishopsteignton (S. Devon).—Huntly Hotel.
Blackpool.—The Headlands. A.A. & R.A.C.
Bognor Regis.—Royal Norfolk Hotel.
Boscastle.—Welltown Manor Guest Hse. Tel. 17.
Bournemouth.—Bourne Hall Hotel. Tel. 5.
Bournemouth.—Canford Cliffs Hotel.
Bournemouth.—Tollard Royal.
Brighton.—The King's Hotel.
Brighton (Rottingdean).—Tudor Close Hotel.
Bushey.—Bushey Hall Hotel.
Chipping Campden.—Cotswold Hse. Htl. Tel. 330
Crowborough (Sussex).—The Crest Hotel.
Dulverton.—Carnarvon Arms.
Dulverton (Som.).—Woodcote Hotel. Tel. 129.
Exeter.—Royal Clarence Hotel.
Falmouth.—Greenbank Hotel.
Falmouth.—Hydro Hotel.
Folkestone.—Princes Hotel. Telephone 2666.
Folkestone.—Queen's Hotel. Telephone 2219.
Goring-on-Thames.—The Bull. Tel. Goring 57.
Grassington (Yorks.).—Devonshire Hotel. Tel. 25
Hove.—Dudley Hotel. Completely modernised.
Lyme Regis.—Hotel Alexandra. Tel. 10.
Lytham (Lancs.)—Clifton Arms Hotel.
Manchester.—Bowdon Hydro.
Newquay.—Hotel Bristol. On sea front. Tel. 2857
Newquay.—Headland Hotel. Tel. Newquay 2211.
Paignton.—Palace Hotel. A.A.
Paignton.—Ravenswood Hotel. Cliff Road.
Paignton.—Redcliffe Hotel.
Penzance (Cornwall).—Queen's Hotel.
Salisbury.—Old George Hotel. Tel. 3189.
Sanderstead (Surrey).—Selsdon Park Hotel.
Scarborough.—The Grand. 'Phone: 1053.
Scarborough.—Royal Hotel.
Shaftesbury (Dorset).—Coombe House Hotel.
Sidmouth.—Cedar Shade Hotel.
Sidmouth.—The Torbay Hotel.
Storrington (nr. Pulborough).—Roundabout Htl.
Torquay.—Headland Hotel. Torquay 2161.
Torquay.—Lincombe Hall. Tel. 2302.
Torquay.—Roslin Hall Hotel. Tel. 4373 (2 lines)
Treyarnon Bay (Cornwall).—Waterbeach Hotel.
Tunbridge Wells.—The Spa Hotel.
Twyford (Berks.).—Grove Hall Hotel. Tel. 106
Weymouth.—Royal Hotel. Tels. 627 & 628.
Worthing.—Greystoke Private Hotel. Tel. 991.

ENGLAND—*continued*

ENGLISH LAKES

Keswick.—Borrowdale Hotel. Borrowdale 24.
Keswick.—Royal Oak Hotel.

LONDON

Ambassadors Hotel, W.C.1. Tel. Euston 1456.
Bailey's Hotel, Gloucester Road, S.W.7.
Dorset Square Hotel. Off Baker St., N.W.1.
S. Kensington Htl. Queen's Gate Terrace, S.W.7.

SCOTLAND

Gairloch (Ross-shire).—Gairloch Hotel.
Glendevon (Perthshire).—Castle Hotel.
Glen o'Dee (Banchory).—Royal Deeside Hotel.
Grantown-on-Spey.—Grant Arms Hotel.
North Berwick.—Marine Hotel.
Oban.—Alexandra Hotel.
Oban.—Great Western Hotel.
Onich (Inverness-shire).—Creaghdhu Hotel.
Pitlochry.—Pitlochry Hydro.
Rothesay.—Glenburn Hotel.
Skelmorlie.—Skelmorlie Hydro.
Stranraer.—Auld King's Arms.
Troon.—Marine Hotel.

CHANNEL ISLANDS

Jersey.—St. Brelade's Bay Hotel.

WALES

Bangor.—Castle Hotel.
Llangollen.—The Hand Hotel.

NORTHERN IRELAND

Belfast.—Grand Central Hotel.
Rostrevor (Co. Down).—G.N.R. Hotel.

EIRE

Bundoran (Co. Donegal).—G.N.R. Hotel.
Dun Laoghaire (Kingstown).—Ross's Hotel.
Glendalough (Co. Wicklow).—Royal Hotel.
Greenore (Co. Louth).—G.N.R. Hotel.
Greystones (Co. Wicklow).—Grand Hotel.
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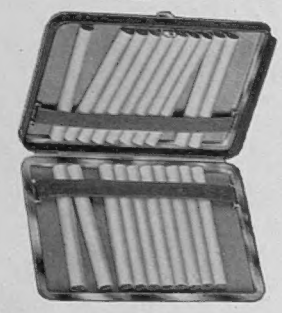

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In Quest of Good Hotels

By ASHLEY COURTENAY

THE Dorset coastline has a character of its own. Not anywhere else in these islands will you find quite the same mixture of ancient splendour and miniature delight. Broad sweeps of open country to be seen at one moment, fascinating little coves and inlets at another. But where Nature has been most bounteous, Man proves economical, and there are few hotels along this particular stretch of coast. The area round Lulworth's famous coves is meant to be looked at rather than lingered in. The beauties of Warbarrow and Kimmeridge Bay can be admired by the passing motorist, but the neighbourhood offers no suitable resting place, and since properly to enjoy these sights the car should be abandoned, and the district explored on foot, the solution is obvious—stay a few miles inland.

At Swanage, for instance, you will be more than comfortable at the Highcliffe Hotel, which has been run by successive members of the same family for more than forty years. A criterion of their ability is offered by the fact that the same people forgather there year after year, from bishops to business men, and always find themselves well looked after.

If you are determined not to stay in a town, there is Knoll House Hotel, Studland, only a few miles from Swanage, and an equally good "jumping off point" for exploring the beauties of Purbeck Downs. For anyone who enjoys riding, this is an ideal holiday spot, for the hotel has the freedom of 10,000 acres of the Isle of Purbeck, and maintains its own riding school; you will find that most visitors to Studland manage to leave it decidedly "horse conscious."

Travelling westward from Weymouth towards the Dorset-Somerset border, the coastline is equally ill-served by hotels, and once more the traveller must turn inland for his headquarters. A most excellent centre from which to explore this part of the Dorset coast is Dorchester. Steeped in history, this quaint old market town wears an atmosphere of serenity even in these troublous times, not least among its charms being the Antelope Hotel. Although its proprietor is a barrister, there will never be "legal quibbles" about the food or the service, both of which are first class.

Farther west still, towards Bridport, the country gets ever more lovely, and those who appreciate a really quiet holiday should investigate Manor House Hotel, Bexington. Nestling at the foot of green hills, enjoying an uninterrupted view of rolling sea, you will find the charm of everything that is ancient and old-world within its stone-flagged corridors, combined with the benefits of modern innovation in every bedroom. The only thing I have against it is that the cooking is so good that it is difficult to take the exercise you have probably promised yourself!

The Bridport Guest House, Battlecombe, run by two University women, is another good "stopping-off place" in this part of the world.

North Dorset offers a bigger selection of attractive by-ways than almost any other county, and from such centres as Shaftesbury or Sherborne you can explore for miles, discovering forgotten hamlets and old-world villages, without ever setting eyes on a white line or a charabanc. For such rural reconnaissance the Coombe House Hotel, Shaftesbury, is a good headquarters.

Acres of glorious garden, rich in trees and fragrant with flowers, tennis courts and a practice golf course combine to compose an estate rare in beauty. This magnificently built house is designed to minister to your comfort both internally, for the cooking is first class, and externally also.

It is quite near Dorchester that you come across two little villages with the quaint names of Puddletown and Tolpuddle, the latter famous for its six martyrs, working men whose valiant endeavours in the last century to get a higher rate of pay from the landowners resulted in their deportation to Australia, but was the ultimate foundation of trade unions. To this day there stands in the centre of a Tolpuddle street the Martyrs' Oak, planted in memory of George Lovelace, originator of the movement. A few miles beyond lies the sleepy little village of Cerne Abbas with its fourteenth-century church and a wishing well for the superstitious near the churchyard wall.

There is one modern note in Cerne Abbas, though by no means an aggressive one, and that is Cockers, a delightful 400-year-old guest house. I cannot guarantee that guests have been housed there for that length of time, but I can assure you that anyone who stays there now would find it difficult to remember the ancient origin of the building, while enjoying the up-to-date comforts of the residents' lounge, and the attractively furnished bedrooms with their hot and cold water, and bedside lamps.

The Old House, Cerne Abbas, is, I am told, another comfortable resting place for anyone wishing to investigate Dorset's delights at leisure.

ANSWERS TO CORRESPONDENTS

R. S., Bournemouth.—I have the very place for you and your husband when he gets his leave. It has all the essentials you ask for, and its name is: The George, Alfriston, Sussex; a sweet little village nestling in the Downs.

A. G., Northampton.—I have the very hotel for you, and it is called the Greenbank Hotel at Falmouth. It has a marvellous position overlooking Falmouth harbour, especially if you were to book number one suite.

Mr. Ashley Courtenay is always pleased to advise "Sphere" readers of hotels, both large and small, known to him personally. Letters should be addressed to him, c/o the Editor, THE SPHERE, *32–34, St. Bride Street, London, E.C.4. Personal and telephone inquiries, however, cannot be accepted.*

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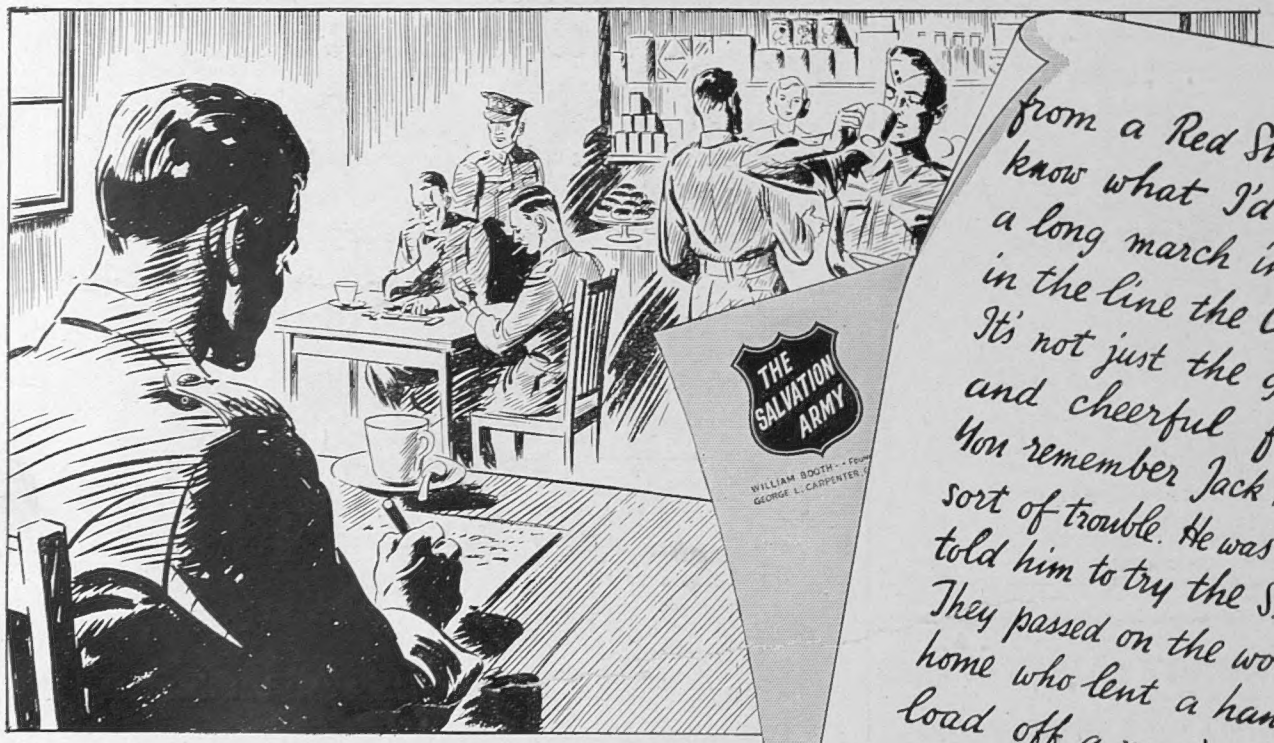

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GENERAL CARPENTER, 101, QUEEN VICTORIA ST., E.C.1

(2)

from a Red Shield Club again. I don't know what I'd do without them. After a long march in the rain or a spell in the line the Club seems like home. It's not just the grub—it's the warm and cheerful friendliness.

You remember Jack? His wife got into some sort of trouble. He was worrying himself sick. I told him to try the S.A. people and he did. They passed on the word to their people back home who lent a hand at once. What a load off a man's mind that means.

At [redacted] where I was last, there was no Red Shield Club.★ I missed the welcome break coming off duty. But they don't spring up like mushrooms, someone has to give the money to build the huts

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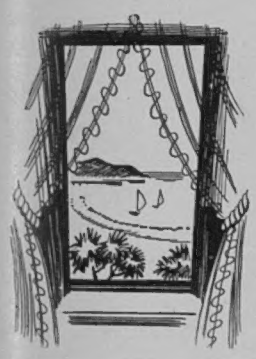

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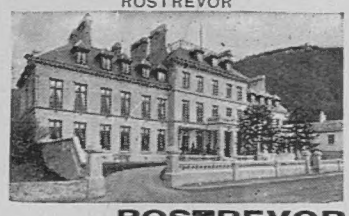

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